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Gaming/Simulation As A Learning Method In A High School Career Education Course.

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GAMING/SIMULATION AS A LEARNING METHOD IN A HIGH SCHOOL CAREER EDUCATION COURSE

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GAMING/SIMULATION AS A LEARNING METHOD IN A HIGH SCHOOL CAREER EDUCATION COURSE

Abstract of Dissertation

PROBLEM: There is a need to explore new learning techniques which help high school students experience new levels of career maturity. The primary objective of this study was to investigate the effect on career maturity of including a gaming/simulation technique, the Life Career Game, developed by Sarane S. Boocock, in a high school career education course as compared with a more conventional didactic/audio-visual treatment.

PROCEDURE: Four experimental and three control groups were established at two high schools in separate California School districts to obtain data on the problem under investigation. The groups were formed from eleventh and twelfth grade students enrolled in social science type courses which included a career education component. A Nonrandomized Control-Group Pretest-Posttest Design was utilized in the study. Pretesting commenced in the fall of 1975 and posttesting was administered approximately three months later. The Career Maturity Inventory, developed by John O. Crites, was the instrument selected to measure the dependent variable of career maturity. The Life Career Game treatment was presented to the experimental groups whereas the control groups experienced the conventional didactic/audio-visual approach to career education. The sample consisted of 144 students. Analysis of covariance (ANCOVA) was used to detect differences on the Career Maturity Inventory scores.

FINDINGS: The findings of this study do not clearly indicate that the use of the Life Career Game will significantly affect cognitive and affective dimensions of career maturity. Research hypothesis one which proposed that students participating in the Life Career Game would show greater gains in career attitudes was not supported. The second research hypothesis which stated that career competencies would be significantly greater for those in the Life Career Game groups was partially supported. The scores in competence sections of the Career Maturity Inventory which relate to problem solving and planning revealed significant differences for the students who played the Life Career Game but these differences seemed to be associated with the particular school involved. The findings suggest that the way in which the Life Career Game is implemented in a career education course significantly influences its effectiveness.

RECOMMENDATIONS: The following recommendations for further research were made: (1) Development and research of new gaming/simulations based on the Life Career Game model which have more motivational power should be undertaken. (2) The effects of voluntary participation as contrasted with required participation in a gaming/simulation experience could be clarified. (3) Further research on the validity of the Career Maturity Inventory for measurement of career education objectives would be beneficial. (4) Research is needed which would provide new instruments to evaluate career education programs. (5) Student perceptions of their career planning needs should be investigated. (6) Counselors with

expertise in career education should serve as school coordinators to assist students and staff. (7) Career education courses in teacher education programs should be expanded and further researched in regard to their effectiveness in preparing teachers to develop students' career maturity levels.

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THE PROBLEM AND OBJECTIVES OF THE STUDY

INTRODUCTION

There has been a trend in education for the teacher or counselor to be a facilitator rather than a dispenser of knowledge. The rationale for this type of approach rests on the assumptions that students develop independent learning styles, clearer self-concepts, better cognitive skills and more cognitive knowledge when they are actively involved in an educational process.[1] The conventional approach where the emphasis is on the dispensing role differs from the facilitating approach by stressing monologue, thus restricting or eliminating dialogue and the process of exploring alternatives.

Gaming and Simulation (G/S)[2] has received attention during the last decade as a technique which emphasizes process and allows for facilitation of the educational experience. It has been applied to many areas of learning including military training, the social sciences, teacher education and career education.

Career education, as a new concept, tends to stress the importance of helping students discover an affective and cognitive

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[1]Jerome S. Bruner, The Process of Education (New York: Vintage Books, 1963), pp. 17-32.

[2]Gaming/Simulation or G/S refers to a structured situation in which human actors participate in a simulated system which involves an element of competition.

synthesis as related to their life careers. A G/S titled The Life Career Game (LCG)[3] was developed to utilize the modes of learning emphasized in the contemporary educational philosophy mentioned above. The present study focuses on this learning method.

THE PROBLEM

Effective methods of assisting high school students in the area of career planning and decision-making are needed. Evaluation of the effect of a G/S method, the LCG, has on dimensions of career maturity could indicate effective means of implementing solutions to the problem.

Statement of the Problem

What, if any, significant changes will the inclusion of a G/S, the LCG, in a high school career education course produce in respect to the career maturity level of students? Career maturity level will be evaluated by the Career Maturity Inventory (CMI)[4] which is divided into Section One, The Attitude Scale, and Section Two, The Competence Test which consists of the following parts: Knowing Yourself, Knowing About Jobs, Choosing a Job, Looking Ahead, and What Should They Do?

Significance of the Problem

In 1972, Sidney Marland Jr., the U.S. Commissioner of Education at that time, pointed out that career education was a high priority in

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[3]Sarane S. Boocock, Life Career Instructor's Manual (Indianapolis: Bobbs-Merril Co., Inc., 1969), p. 15.

[4]John O. Crites, Career Maturity Inventory (CMI) (Monterey, California: CTB/McGraw-Hill, 1973).

terms of national educational needs.[5] Since that time various programs and approaches for career education have been developed nationally and in California. However, it appears that many educators have difficulty in conceptualizing and operationalizing this new concept. Learning methods which are compatible with career education are needed.[6]

Research regarding the effectiveness of G/S as used in career education has been inconclusive. The LCG has been utilized in several research studies and dissertations in a variety of ways and the need for further research is indicated.

A clearer indication of the usefulness of the LCG may assist educators in deciding whether or not to incorporate it into career education programs. The findings of this study should also have concomitant value for the use and development of G/S in other fields as well.

Few studies have focused on the eleventh and twelfth grades or explored the variables mentioned herein with the instruments selected. Thus, this study was designed to provide additional information on this topic.

THE PURPOSE OF THE STUDY

If one accepts the concept that career education should develop independence and flexibility in career planning, then G/S would seem to foster these skills quite well. This study attempts to investigate the

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[5]U.S., Department of Health, Education and Welfare, Career Education (Washington, D.C.: DHEW, Publication No. OE 73-00501, 1972), pp. 8-10.

[6]James R. Hirschinger et al., "The Career Education Syndrome: Implications for California Curricula" (unpublished paper, University of the Pacific, 1974), p. 3.

effect of the G/S, the LCG, as used in an eleventh and twelfth grade career education course.

G/S is reported to have two basic strengths. First, it tends to minimize the role of the teacher/counselor as the purveyor of all knowledge,[7] at the same time increasing the students' responsibility for career maturity development. Second, students gain experiential knowledge of the processes of career decision-making and career planning which they will eventually encounter in real life, thus developing career flexibility.[8]

Experimental and control groups were established at two high schools in separate California school districts to obtain data on the problem under investigation. The groups were formed from eleventh and twelfth grade students enrolled in social science type courses. The experimental groups received a treatment consisting of the LCG. The control groups' treatment was a more conventional approach to career planning emphasizing didactic and audiovisual methods.

The literature regarding G/S as a learning method covers a wide range of disciplines and areas of study. This literature, which includes specific studies on career education and the LCG simulation employed in the current study will be discussed in a review of the literature.

HYPOTHESES

This study analyzes the effect of the inclusion of a G/S, the

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[7]John R. Raser, Simulation and Society: An Exploration of Scientific Gaming (Boston: Allyn and Bacon, Inc., 1969), pp. 114-34.

[8]Boocock, op. cit., p. 4.

LCG, in an eleventh and twelfth grade career education course on specified cognitive and psychological constructs.

The research hypotheses are:

1. Students who participate in the LCG method show greater gains in career attitudes than students who participate in the Didactic/A-V method.

2. Students who participate in the LCG method show greater gains in career competence than students who participate in the Didactic/A-V method.

ASSUMPTIONS AND LIMITATIONS

The experimental and control groups in this study are part of ongoing educational programs which tends to limit rigid control of variables. Therefore, this study was guided by several assumptions and limitations which are as follows.

Assumptions

1. The LCG accurately simulates the referent process of career decision-making and total career planning.

2. Six hours of exposure to the LCG are adequate to create career maturity changes in the students.

3. Teachers and counselors are representative of the potential users of G/S.

4. The sample is representative of the target population.

5. The presence of the experimenter has no effect on the dependent variables.

Limitations

1. Teachers and counselors participating may have different amounts of experience with G/S techniques.

2. Teachers and counselors participating may not match materials and activities precisely in all instances.

DEFINITION OF TERMS

Terminologies which apply to the areas of career education, specific concepts, and methods have been incorporated in this study. These terms are defined below to clarify their use in this context.

1. Career Education: The total effort of public education and the community aimed at helping individuals to:[9]

   a. understand their needs and values

   b. gain greater awareness of job clusters

   c. explore new career and social alternatives

   d. develop new, personalized life-styles

   e. become aware of social institutions, the role of government and the business world

   f. develop empathic communication between students, parents, teachers and counselors[10]

2. Career Education Course: A course, or unit of a course in a social science or language arts setting[11] which affords students the opportunity to experience career education objectives.

3. Career Maturity Inventory (CMI): An inventory developed by Crites which measures maturity of career attitudes on an Attitude Scale (CMI-ATT) and career competencies on a Competency Scale (CMI-COMP) that are important in realistic career decision-making.[12]

4. Didactic/A-V: The control group treatment consisting of

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[9]Maryland State Department of Education, Career Education: A Handbook for Implementation (Washington, D.C.: DHEW, February, 1972), p. 8.

[10]Hirschinger et al., op. cit., pp. 1-2.

[11]These seem to be the typical settings where career education is taught other than in designated career education courses.

[12]John O. Crites, Career Maturity Inventory-Administration and Use Manual (Monterey, California: CTB/McGraw-Hill, 1973), p. 3.

lectures, conventional career-search inventories and audiovisual approaches to career planning.

5. G/S-Gaming/Simulation(s): A structured situation in which human actors participate in a simulated system which involves an element of competition.

6. The Life Career Game (LCG): A G/S developed by Boocock which simulates the process of planning career variables for an imaginary individual as sketched in a profile.[13]

7. Referent Process: A process existing in the real world which the G/S attempts to simulate.

SUMMARY

There is a need to explore new techniques which help high school students experience new levels of career maturity. The learning method of G/S was suggested as a means of enhancing the possibility of this objective being reached. This method reduces certain referent processes to a more manageable level of understanding.

The LCG simulates the referent process of total career planning. Teams of students plan several years in the life of an imaginary individual in respect to economic, occupational and social variables. The team which obtains the highest point total wins the LCG.

The problem was to investigate the effect of including the LCG in a high school career education course as compared to a more conventional Didactic/A-V treatment. The results could have implications for career education curricula.

An eleventh grade class from one high school and a twelfth grade

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[13]The profiles provided with the LCG sketch an imaginary individual's social and academic background. Teams of students are to use one of these profiles and to plan the next eight years of that imaginary person's life. The team which scores the most points wins the LCG.

class from a high school in another California district were used to obtain a sample; experimental and control groups were created from students enrolled in social science courses. The CMI was used to measure career maturity levels.

Four additional chapters complete this study. They are: Chapter 2: Review of the Literature Related to the Study, Chapter 3: The Design and Procedure of the Study, Chapter 4: Analysis of Results and Discussion of the Data, and Chapter 5: Summary, Conclusions and Recommendations for Further Study.

Chapter 2

REVIEW OF THE LITERATURE

INTRODUCTION

The purpose of Chapter 2 is to review and report on previous work done in connection with Gaming and Simulation (G/S) and career education. Two computer-assisted searches were completed, one by DATRIX (Xerox) and the other by San Mateo Educational Resources Center, in addition to manual searches of ERIC, Dissertation Abstracts International, Education Index, and other resources. This chapter is divided into five major sections which are organized to reflect focusing of the literature on the topic.

1. Career Planning Concerns of the General Population
2. Career Education
    a. Conceptual Development
    b. Vocational Theory and Career Education
    c. School-Based Models of Career Education
3. The Evolution of G/S as a Learning Method
    a. Background
    b. War Games
    c. G/S in Business, Management and Economics
    d. G/S in Political Science
    e. G/S in Sociology
    f. G/S in Psychology

g. G/S in Education

4. G/S and Career Education

5. Research Using the Life Career Game (LCG)

CAREER PLANNING CONCERNS OF THE GENERAL POPULATION

The life-work or career of an individual has historically tended to provide an indication of that individual's social role, world view, and daily existence. As Pavalko states:

> Sociologists who study work diverge on many points, but a fundamental assumption running through their interest in the topic is that occupations are social roles [italicized in original]. As such, specific occupations serve to locate their incumbents in a matrix of other social (occupational) roles.[1]

Satisfaction with one's social role affects, and is affected by, one's world view and ultimately determines the quality of daily existence. Dissatisfaction with a particular social role seems to have strong implications for an individual's career needs. A person frustrated with his role may manifest this frustration in a general alienation toward the people, processes, or machines he encounters.

The level of career dissatisfaction in the United States has not been clearly established. However, recent literature seems to suggest that alienation which is career-related has reached noticeable proportions. "The accounts of workers who are not satisfied with their jobs," comments Morris, "are more prevalent than those expressing job satisfaction."[2] Terkel encapsulates this discontent with work and career

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[1]Ronald M. Pavalko, Sociology of Occupations and Professions (Itasca, Illinois: Peacock Publishers, Inc., 1971), p. 3.

[2]John Morris, "Issues in Career Education," The Clearing House, Vol. 48 (September, 1973), 34.

by stating:

> For the many, there is hardly concealed discontent. The blue-collar blues is no more bitterly sung than the white-collar moan. "I'm a machine," says the spot-welder. "I'm caged," says the bank teller, and echoes the hotel clerk. "I'm a mule," says the steelworker. "A monkey can do what I do," says the receptionist. . . . "There is nothing to talk about" the young accountant despairingly enunciates.
>
> As the automated pace of our daily jobs wipes out name and face--and, in many instances, feeling--there is a sacrilegious question being asked these days. . . .[3]

This question, Terkel says, is the one which queries the value and necessity of the "work ethic"; it has been posed by people of all ages but especially by the young.[4] The "work ethic" issue has permeated the criticism of career education and is discussed further later in this chapter.

Whether due to the discontent with a particular job discussed above or because automation has phased the job out, there is an increasing trend toward the changing of careers. Bolles observed this trend and stated:

> Experts estimate, the average worker will change careers, now, three to five times in his or her lifetime--i.e., go into a new field for which (upon first examination) his previous experience would not seem to qualify him or her.[5]

This concern for the plight of the current "career changer" has been shifted to our educational institutions and perhaps has provided the stimulus for what has come to be known as career education. The career education concept seems to promise a means of minimizing the incidence

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[3]Studs Terkel, Working (New York: Avon Books, 1975), p. xiv.

[4]Ibid.

[5]Richard Nelson Bolles, What Color Is Your Parachute? (Berkeley, California: Ten Speed Press, 1972), p. i.

or difficulty of career change. Marland believes, "Career education prepares the individual for employment and, later in his career, upgrades his skills, updates his knowledge, retrains him for a new job."[6]

The dynamics of our national work-force, at all levels, have economic and political ramifications which influence the emerging concept of career education. An examination of the literature indicates that there are two distinctly differing views being advocated for career education. The more traditional approach emphasizes the primacy of the national economy and the value of the work ethic. More recently, however, another view is advocated in which there is less concern with job orientation per se, than with the development of the individual and his life style.[7]

Whether career education will ultimately ameliorate the career and life experiences of a significant number of citizens is difficult to determine. However, a careful scrutiny of the etiology of the career education concept may be useful in clarifying the dominant themes and directions.

CAREER EDUCATION

Career education has become a distinctive force in contemporary efforts to reform our educational system at all levels. New theory, curricula, and legislation illuminate the way for educators who are

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[6]U.S. Department of Health, Education and Welfare, Career Education (Washington, D.C.: DHEW, Publication No. OE 73-00501, 1972), p. 3.

[7]James R. Hirschinger et al., "The Career Education Syndrome: Implications for California Curricula" (unpublished paper, University of the Pacific, 1974), p. 1.

endeavoring to implement this concept.

Conceptual Development of Career Education

The concept of helping an individual in the planning of his life-work is not unique to career education. Vocational guidance has addressed this area of concern for some time although perhaps without the philosophical breadth with which career education has envisioned it.

"Traditional vocational education legislation from 1917's Smith-Hughes Act to 1963 had emphasized training to meet the skill needs of the labor market," according to a Maryland Department of Education publication.[8] During the early sixties career guidance projects were instituted in Florida, Wisconsin, New Jersey, New York, Michigan, and California as well as other states.[9] For example, in 1968 two projects were designed to serve the needs of minority youth. They consisted of philosophies and strategies, including G/S, similar to those suggested in the career education concept which emerged later. The two projects were Project Beacon in Rochester, New York, and the Detroit Developmental Career Guidance Project.[10]

The Department of Health, Education and Welfare, in 1971, set forth the career education concept in a publication titled Career Education.[11] Marland pointed to the need for educational reform in this

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[8]Maryland State Department of Education, Career Education: A Handbook for Implementation (Washington, D.C.: DHEW, February, 1972), p. 34.

[9]Ibid., pp. 31-33.

[10]Hirschinger et al., op. cit., pp. 15-16.

[11]U.S. Department of Health, Education and Welfare, op. cit.

publication by stressing, "Nearly 2.5 million students leave the formal education system of the United States each year without adequate preparation for a career."[12] He also opened a dialogue on the topic when he commented that "Career education cannot be defined solely in Washington."[13] Four career education models have been presented by the Office of Education in order to give some direction. These models are listed below:

Model 1: School-based Comprehensive Career Educational Model

Model 2: Employer-based Career Education

Model 3: Home-based Career Education

Model 4: Rural-residential Career Education[14]

Most of the literature reviewed for this study concerns the School-based Comprehensive Career Education Model. The principles of this model can be applied to the other models listed above. Reaction of educators to these initial models called for a broader view of career education. Gordon holds the belief that career education ". . . must be concerned more with facilitating the processes of living [italics in original] and less with preparation for making a living. . . ."[15] This belief has become an important one with extensive ramifications. It suggests that an individual may assume a variety of roles during a life-time with the role of "worker" being only one of these roles. Other roles such as

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[12]Ibid., p. 1.

[13]Ibid., p. 10.

[14]Lois-ellin Datta and Corinne H. Rieder, "Career Education in the National Institute of Education," New Generation, Vol. 55, No. 1 (Winter, 1973), 9-11.

[15]Edmund W. Gordon, "Broadening the Concept of Career Education," New Generation, Vol. 55, No. 1 (Winter, 1973), 25.

family member, consumer, and social-political being could also become primary roles. Preparation for these roles is therefore important.[16]

Nash and Agne concur with this broad view of career education. They maintain that:

> . . . career educators will have to construct programs more sensitive to young people's needs to absorb and integrate all kinds of knowledge (liberal, spiritual, instrumental, sexual, expressive, political, scientific).[17]

This approach avoids restrictive vocational specialization and assists in the development of the total self.[18]

The ideological and pedagogical premises of career education are critiqued by Nash and Agne. They point out that the literature has failed to warn of possible misuse of the career education concept as well as neglecting to discuss explicitly the learning theory utilized.[19] Their opinion that, "At the heart of the career education movement is an ideological commitment to a corporate social order,"[20] and consequently the work ethic, has implications for career education theory and practice. This commitment implies that human behavior is achievement-motivated and places emphasis on external rewards and status enhancement.[21] Clearly, one can see a parallel between the stratification of workers which occurs in our industrial system, and the potential for the tracking of students in career education programs. This similarity

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[16]Ibid.

[17]Robert J. Nash and Russel M. Agne, "Career Education: Earning a Living or Living a Life," Phi Delta Kappan, Vol. LIV, No. 6 (February, 1973), 376.

[18]Ibid.

[19]Ibid., p. 373.

[20]Ibid.

[21]Ibid., pp. 373-74.

should be recognized.[22] Further, Nash and Agne censure the minimal student exposure to alternative social models inherent in most career education paradigms.[23]

The exploration of alternative social models could be important. For example, Morris maintains that future conceptions of the value of work may be at variance to the way career education proponents now view it. Morris raises two basic questions: first, he queries whether career education can make work possible, meaningful and enjoyable for every individual in light of the realities of present unemployment ratios and work culture; second, as job requirements continue to rapidly change, will career education become a futile exercise in obsolescence and fail as most vocational secondary programs have?[24] Berg recently echoed Morris' concern with the feasibility of making work possible and enriching for every citizen by stating:

> Under ideal conditions, all [italics in the original] youths would be better equipped to exploit the bountiful offerings of a growing economy with increasing numbers of "good," i.e., demanding, well-paid jobs, and problems incidental to pupils' lack of control over economic forces are minimal.
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> "Conditions" are not ideal however, and "career education" cannot affect those conditions shaping demand, structural or otherwise.[25]

The literature reveals the scope of concern about career education. This concern is multi-disciplinary and indicates the need to investigate all ramifications of the movement.

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[22]Ibid., p. 374. [23]Ibid.

[24]Morris, op. cit., pp. 32-36.

[25]Ivar Berg, "'Career Education': A Perspective on Prospects," The Generator, American Educational Research Association, Vol. 6, No. 1 (Fall, 1975), 7.

Vocational Theory and Career Education

Reference is frequently made to vocational theory in the literature on career education. Examination of vocational theories which tend to be consistent with career education models may provide additional perspective on the topic.

Hansen recognizes the problem that ". . . students do not get the help they need or want in exploring themselves and careers and that the help they get often is based on outmoded matching models of vocational guidance."[26] Again, a broader and more humanistic tack in career planning is sought for career education.

Vocational or career development, as theorized by Super and Overstreet, is a process of developing and implementing a self-concept, not a matching model and therefore seems more appropriate for career education.[27] The basic elements of this self-concept theory of development are:

1. Formation
    a. Exploration of self
    b. Self-differentiation
    c. Role-playing
    d. Reality testing from role-playing
    e. Time perspective
2. Translation of self-concept into occupational terms

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[26]L. Sunny Hansen, "A Model for Career Development Through Curriculum," Personnel and Guidance Journal, Vol. 51, No. 4 (December, 1972), 243.

[27]Ibid.

3. Implementation of self-concept[28]

The degree of development resulting from this process denotes the level of vocational maturity. As reported by Isaacson, Tiedman and O'Hara hold a similar view of career development as previously outlined and believe that the process spans most of a person's life.[29] Consequently, the level of vocational maturity may continue to change late in life especially if significant career changes are required.

Isaacson also reported that Ginzberg and others make specific application of this self-concept theory to adolescents. They maintain that there are four factors crucial to the development of a suitable career plan during the adolescent period:

1. Provision for reality testing
2. Development of an understanding of time
3. The ability to wait for satisfaction and reward
4. The ability to accept and adjust to compromise[30]

Selection of these particular vocational choice theories have been made because they place emphasis on the adolescent phase of development which corresponds to the study's focus on career education at the secondary level. However, cognizance should be made of the fact that career development can be influenced at all levels of the educational system.

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[28]Robert Hoppock, Occupational Information (New York: McGraw-Hill Book Company, 1967), p. 94.

[29]Lee E. Isaacson, Career Information in Counseling and Teaching (Boston: Allyn and Bacon, Inc., 1971), p. 55.

[30]Ibid., pp. 42-44.

School-Based Models of Career Education

The original career education school-based model suggested in 1971 by DHEW placed career awareness at the elementary level; career exploration at the junior and senior high level; and actual work experience at the senior high level and beyond. The broad objectives of the model include nurturance of: life-style awareness; decision-making skills; knowledge of career clusters and requirements; and the ability to synthesize knowledge of self and the world of work. Also, school and community resources were to be expanded. Hansen outlined eight strategies for accomplishing these objectives:

Strategy One:	Orientation and awareness (primary years)
Strategy Two:	Prevocational self-exploration experiences (intermediate or middle school years)
Strategy Three:	Career exploration module (8th or 9th grade)
Strategy Four:	Senior high information program (9th-12th grades)
Strategy Five:	Exploratory occupational information interviews (10th-12th grades)
Strategy Six:	Career contracts with counselor or teacher-counselor (11th-12th grades)
Strategy Seven:	Exploratory work experience (10th-12th grades)
Strategy Eight:	Career development subject teams (junior and senior high)[31]

G/S techniques, with special reference to the LCG, are recommended by Hansen for use in strategy three.[32]

Stevenson discusses comparable models existing in Wisconsin and

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[31]Hansen, op. cit., pp. 244-49.

[32]Ibid., p. 246.

Iowa.[33] However, state and local needs reflecting economic and ethnic considerations may cause some changes in these models. A position paper on career education in California declares:

> A great diversity exists in California schools; therefore, the proposed model for career education contained in this publication--with associated goals, components, and infusion processes--provides general guidelines for district- and school-level activities.[34]

The legal impetus for implementing this career education model is based on section 7504 of the California Education Code.

A part of the diversity mentioned in the position paper above refers to the cultural diversity of students in California. Black and Chicano students will be helped by career education only if models and practices are sensitive to their cultural and/or socioeconomic backgrounds.[35] Kearny and Clayton express concern for the general lack of input of minorities in developing career education and the possible effect of tracking minorities away from higher education.[36] A warning was presented by Chisholm in reference to over emphasis on the middle-class work-ethic and of the inappropriateness of having disadvantaged minority children look to their family members as career models, when in actuality

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[33]John B. Stevenson, An Introduction to Career Education (Belmont, California: Wadsworth Publishing Co., Inc., 1973).

[34]California State Department of Education, Career Education Task Force, Career Education: A Position Paper on Career Development and Preparation in California (Sacramento, California, 1974), p. v.

[35]Hirschinger, op. cit., pp. 10-17.

[36]Annette G. Kearney and Robert L. Clayton, "Career Education and Blacks: Trick or Treat?" The School Counselor, Vol. 21, No. 2 (November 1973), 102-108.

they may be chronically unemployed.[37] Several safeguard mechanisms have been offered for the California model to avoid these possibilities:

1. Parent participation in program planning, development, and evaluation
2. Affirmative action components
3. Ethnically based support services from local communities to provide tutorial services, motivational activities, guidance and the like[38]

Attempts to introduce career education in California schools varies from the establishment of total career education high schools such as Mesa Verde High School in Citrus Heights, to the more common career-center idea found in many high schools. Evaluation of their impact is just beginning, consequently it could be some time before current models can be refined.[39]

The development, refinement, and evaluation of G/S has a somewhat longer history than does career education. Still, as with career education, there are many unanswered questions requiring further investigation. The next section deals with the evolution of G/S as a learning method and clarifies the relationship between G/S and career education.

THE EVOLUTION OF G/S AS A LEARNING METHOD

G/S has historically been used in an effort to obtain some sense of how a future, or past, activity affects human response. Career

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[37]Shirley Chisholm, "Career Education and Minorities," New Generation, Vol. 55, No. 1 (Winter, 1973), 26-28.

[38]California State Department of Education, op. cit., p. 22.

[39]Stephen H. Ellis, Naneene S. Ellis, and F. Lane Mason, "A California Study of Career Centers" (San Diego, California: Ellis-Prosser Research, 1975) (Xeroxed).

education is primarily interested in dealing with future career occurrences and their influence on people. If individuals can "test" these future realities, perhaps more effective responses can be planned. The concept of "reality-testing" provides a basis for understanding the raison d'être and the evolution of G/S.

Background

Man has long tended to engage in forms of play activity structured into what is known as "games." A work on man and his games which has become a "classic" in the field is Homo Ludens by John Huizinga.[40] Raser interprets Huizinga by noting:

> . . . [Huizinga] proposes that most human institutions and human activities are in large part simply the product of the human desire to engage in ever more, elaborate, subtle, and satisfying forms of play.[41]

Whether social institutions are derived from games or whether games merely reflect a referent social system is open to speculation. G/S combines the elements of play and competition found in games with an accurate analogue of some referent system.[42] Participants in the G/S can gain understanding of the referent system which is perhaps why Raser stresses that, "Familiarity with simulation is a prerequisite for understanding contemporary social and behavioral science research and teaching techniques."[43]

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[40]Sarane S. Boocock, "From Luxury Item to Learning Tool: An Overview of the Theoretical Literature on Games," Simulation Games in Learning, eds. Sarane S. Boocock and E. O. Schild (Beverly Hills, California: Sage Publications Inc., 1968), p. 54.

[41]John R. Raser, Simulation and Society: An Exploration of Scientific Gaming (Boston: Allyn and Bacon, Inc., 1969), p. vii.

[42]Ibid., p. x.

[43]Ibid.

War Games

The harsh realities of war have been "tested" by means of G/S. "The genesis and evolution of war games are obscure, but they are closely related to, and perhaps a direct outgrowth of chess and similar board games played for pleasure," according to Raser.[44] Bilek explains that as teaching tools, war games or Kriegspiel, were probably first used by the Prussians in the mid-seventeenth century to teach military strategy after they adapted the game of chess. They were very structured at first, but gradually became more flexible in respect to the playing rules. Role-playing and elements designed to simulate actual war conditions, such as logs for cannons and bags of flour for bombs were eventually added.[45]

The popularity of the Kriegspiel concept led to its extensive use in the United States at West Point in the last quarter of the nineteenth century.[46] During World War II the armed services of many countries found it expedient to teach many kinds of complex procedures by the use of G/S.[47]

A contemporary attempt at war gaming designed by the United States Joint Chiefs of Staff War Games Agency titled, Technological, Economic, Military and Political Evaluation Routine (TEMPER), reveals its designers' awareness that to be meaningful, a war game must be set in the larger social context.[48] Electronic computers have enabled researchers

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[44]Ibid., p. 46.

[45]Robert C. Bilek, "As Promised: Introduction to S/Ging," Simulation/Gaming/News, Vol. 1, No. 3 (September, 1972), 3.

[46]Raser, op. cit., p. 47.

[47]Bilek, loc. cit.

[48]Raser, op. cit., p. 49.

to evaluate these complex social variables and thus enhance and expand the application of G/S in all fields.[49]

G/S had been used in the military for well over two hundred years before they were seen as being applicable to business and industry. Now, such transition has become widespread.[50]

G/S in Business, Management and Economics

Shubik believes that games such as Monopoly and the more complex business games can be classified as war games. This connection between war games and business has also been noted by Raser[52] and by Tansey and Unwin.[53] They support this view by citing the adaptation of war games to business by the American Management Association in 1956 after its members visited the Naval War College.

Many large corporations have since developed training G/S, some of which require computers and some that are based on role-playing models. Those activities which are computer based, and hence very structured, tend to fall under the definition of a game and those based on role-playing are considered simulation; a G/S combines the features of both models. Regardless of the particular model, they are used in business, management and economics to simplify problems and to extract

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[49]Ibid., p. 55.

[50]P. J. Tansey and Derick Unwin, Simulation and Gaming in Education (London: Methuen Educational Ltd., 1969), pp. 2-3.

[51]Martin Shubik, Games for Society, Business and War (Amsterdam, The Netherlands: Elsevier Scientific Publishing Company, 1975), p. 22.

[52]Raser, op. cit., p. 54.

[53]Tansey and Unwin, op. cit., p. 4.

those essential features on which wise decision-making hangs.[54]

Researchers have had success in predicting economic factors up to six months in advance. However, other social sciences, several of which will be examined next, have had no success in prediction by simulation.[55]

G/S in Political Science

Another outgrowth of war games has been the use of G/S technique in political science. Shubik[56] and Raser[57] trace these efforts in the 1950's, which took place at the Rand Corporation and at M.I.T., to introduce political gaming.

The main contributor to political science G/S, with emphasis in the area of international relations, has been Guetzkow. His Inter-Nation Simulation (INS)[58] is a complex man-computer G/S and has served as a model for other G/S developed since then.

G/S in Sociology

Sociological applications of G/S have tended to broaden its use. As Raser advises, ". . . in dealing with simulations it often is a mistake to create artificial distinctions by drawing sharp disciplinary lines" [italics in the original].[59] Raser[60] reported that the first and perhaps best known use of G/S in sociology was the "Robbers' Cave" experiment

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[54]Ibid., p. 5.

[55]Raser, op. cit., p. 56.

[56]Shubik, op. cit., p. 299.

[57]Raser, loc. cit.

[58]Harold Guetzkow (ed.), "A Use of Simulation in the Study of Inter-Nation Relations," Simulation in Social Science: Readings (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962), pp. 82-93.

[59]Raser, op. cit., p. 59.

[60]Ibid., p. 58.

conducted by Sherif in 1961. It involved eleven-year old boys and employed a decision-making, competitive, and conflict resolution format. Shubik speaks to the trend of cross-application of certain G/S which have the above format.

> In the attempts to develop a decision science, much work has been done in areas which are at the interface of the more traditional disciplines. Thus, experiments in competitive behavior may fall into economic [sic], psychology, sociology, or game theory, or combinations. . . .[61]

Another G/S which contains these elements of various disciplines is Simulation of Society (SIMSOC) developed in 1966 by Gamson.[62] It has been used in many types of settings although the research does not clearly establish its productivity as a learning device.

Contemporary G/S in sociology are therefore designed and applied from a multi-disciplinary perspective. This is perhaps the only way that G/S was able to merge into the discipline of psychology.

G/S in Psychology

G/S has not held a prominent place in the discipline of psychology. The reason for this is partly explained by Raser who says, "Gaming has not been a vital part of research or teaching in psychology, probably due to the strongly entrenched tradition that sanctions only highly controlled experiments. . . ."[63] He further mentions, "Some social psychologists have become interested in using game situations to study interaction among a few (usually two) persons in highly structured conflict situations."[64]

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[61]Shubik, op. cit., p. 313.

[62]William A. Gamson, SIMSOC: Simulated Society-Participant's Manual with Selected Readings (New York: The Free Press, 1969).

[63]Raser, op. cit., p. 60. [64]Ibid., p. 61.

The most commonly used type of G/S in social psychology is the 2x2 matrix game of which the Prisoner's Dilemma game is most famous.[65] The researcher found thirty-five studies involving the Prisoner's Dilemma game and its relationship to such variables as schizophrenia, reinforcement, religion, cooperation, and parent occupation.

Psychology has made limited use of G/S although some techniques akin to G/S, such as psychodrama, have been infused into clinical settings. A number of psychological G/S, such as Group Therapy, have appeared on the market for distribution mainly to a lay population. As the interest in humanistic psychology increases perhaps enlightened attitudes toward the use of G/S will come forth.

G/S in Education

G/S has gradually become recognized as a learning technique which has potential application to the field of education. The burgeoning awareness of this potential, as reported by Boocock, is found in the works of Dewey, among others, who defended the use of games and believed that they should be considered an integral part of the curriculum.[66] Bruner also holds that G/S is needed in educational settings. He comments that, "Games go a long way toward getting children involved in understanding language, social organization, and the rest. . . ."[67] His creation of the Sealhunt Game acknowledged these learning objectives.

Coleman also has been a leading advocate and researcher in the development of G/S for education; the G/S of the Legislature Game, and

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[65]Shubik, op. cit., p. 244. [66]Boocock, op. cit., p. 56.

[67]Jerome S. Bruner, Toward a Theory of Instruction (Cambridge, Massachusetts: Harvard University Press, 1971), p. 95.

the Parent-Child Game were created and refined with Coleman's guidance. He expresses confidence in G/S when he claims that:

> There are apparently certain aspects of games that especially facilitate learning, such as their ability to focus attention, their requirement for action rather than merely passive observation, their abstraction of simple elements from the complex confusion of reality, and the intrinsic rewards they hold for mastery. By the combination of these properties that games provide, they show remarkable consequences as devices for learning.[68]

From Coleman's point on the desirability of action in learning, one can see the influence of Dewey, who also believed in action as a necessary ingredient for learning.

Boocock worked closely with Coleman at The Johns Hopkins University where G/S have been designed and tested since 1962.[69] She is the individual credited with designing the Life Career Game employed in the present study. The book Simulation Games in Learning, which Boocock co-edited with Schild, has become an oft-cited reference in G/S literature. In it they present a capsule history of the educational adoption of G/S.

> Phase 1: Acceptance on faith
> During this phase, which lasted until 1962 or 1963, social scientists "discovered" gaming as a technique for the classroom, and several games were developed and field tested
>
> Phase 2: Post-honeymoon
> During the years 1963-65, some researchers attempted controlled experiments with G/S. Generally inconclusive results led them to rather sobering conclusions: (a) that G/S is not a panacea for all

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[68]James S. Coleman, "Social Processes and Social Simulation Games," Simulation Games in Learning, eds. Sarane S. Boocock and E. O. Schild (Beverly Hills, California: Sage Publications Inc., 1968), p. 29.

[69]Sarane S. Boocock and E. O. Schild (eds.), Simulation Games in Learning (Beverly Hills, California: Sage Publications, Inc., 1968), p. 278.

educational ills; (b) that G/S in their present forms have serious flaws; and (c) that neither standard tests nor the relatively crude instruments specifically designed to evaluate a particular G/S are adequate measures of the impact of G/S

Phase 3: Realistic optimism
During the last year or two, the trend has been toward renewed (albeit more tempered) optimism, based upon accumulated experience with a number of games. This new phase is characterized by progress on three fronts

(a) Field testing of a number of G/S in a wide variety of educational settings

(b) Accumulation of a pool of data on the learning effects of specific G/S

(c) Revision and clarification of theory or claims concerning what G/S can do in the classroom, based upon additional G/S described in (a) above[70]

Abt, another G/S designer and researcher, has summarized the optimism of those educators who have looked to G/S as the ultimate in modern pedagogy.

> . . . the games method of education at its best includes the following characteristics: A combination of the systems sciences and the dramatic arts--the systems approach for analysis, drama for involvement and motivation. Emphasis is placed on developing analytic approaches and organizing concepts transferable to other problems identified by the students themselves. Intuitive thinking is encouraged, as well as analysis by use of analogy, testing of limiting conditions, and visual expression of solutions. Learning is made entertaining and relevant to the student's life experiences. There is no "talking down" to students---realistic adult materials are used. Learning is achieved by exploratory problem-solving simulations (games) involving role play, with self-directed student participation. Communications and negotiations skills are developed by team activities. A cross-disciplinary, concrete experiential view of problems is expressed dramatically and abstraction capabilities are built on multiple sensory experiences.[71]

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[70]Ibid., pp. 15-18.

[71]Clark C. Abt, "Games for Learning," Simulation Games in Learning, eds. Sarane S. Boocock and E. O. Schild (Beverly Hills, California: Sage Publications Inc., 1968), p. 78-79.

As Boocock and Schild noted previously in phase 3, this enthusiastic view was tempered by reality. Contemporary advocates of G/S however, retain a great many of the essential elements which make G/S an exciting concept for education.

The field testing and data accumulation mentioned in phase 3 previously have yielded a considerable volume of literature on educational G/S for teaching subjects ranging from the physical sciences to the social sciences. It even has been recommended for use in teacher education programs.[72] The majority of the literature concentrates on social science applications of G/S.

The amenability of the social sciences in education to adopt G/S could be partially explained by the fact that mock political conventions, moot courts, and model U.N.'s have been a component of these disciplines for some time. G/S emphasizes process, role-interaction and awareness of self to a greater degree than these exercises, although the basic idea is similar.[73] Brodbelt has studied the use of G/S in the social studies and concluded that, "It is especially useful in the social studies program where so much of man's previous existence is listed as faits accompli [sic] [italicized in original] with little devotion to motivating forces."[74]

A more recent study by Heitzmann investigated the research on

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[72]Donald R. Cruickshank, "The Use of Simulation in Teacher Education: A Developing Phenomenon," Journal of Teacher Education, Vol. 20, No. 1 (Spring, 1969), 23-26.

[73]James A. Robinson, "Simulation and Games," The New Media and Education, eds. Peter H. Rossi and Bruce J. Biddle (Chicago: Aldine Publishing Co., 1966), pp. 86-87.

[74]Samuel Brodbelt, "Simulation in the Social Studies: An Overview," Social Education, Vol. 33, No. 2 (February, 1969), 176-78.

social science simulations. His scholarly treatment of the research on such G/S as Inter-Nation Simulation, Ghetto, Sunshine, the Disaster Game, Trade and Develop, and the Consumer Game led him to write:

> At this point, it becomes painfully obvious that the research of simulation and gaming abounds in confusion and contradiction.
> . . . . . .
> . . . lack of standardization of games, has hindered replication of research findings. As is easily observable, most of the research is scattered, preventing a significant chain of inquiry. In addition to this, the quality of the research varies.
> . . . . . .
> . . . It remains a fertile field with almost infinite research possibilities.[75]

These basic questions and concerns for strengthening the evaluative methods in social science G/S are also presented by Smith in reference to the field of communications. He comments:

> As efforts are made to cope with these questions simulation will take an appropriate place with other accepted research paradigms as an attractive methodological contribution to the study of human communication and human decision-making.[76]

In spite of these limitations in evaluative power, G/S has been recommended for educational use by Hyman[77] in his Ways of Teaching and by Heyman[78] in a Phi Delta Kappa publication titled Simulation Games for the Classroom. These publications tend to illustrate the contemporary appeal of G/S.

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[75]Wm. Ray Heitzmann, "The Validity of Social Science Stimulations [sic]: A Review of Research Findings," Education, Vol. 94, No. 2 (November-December, 1973), 172.

[76]Robert M. Smith, "Toward Measurements of Human Communications Through Simulations," Today's Speech, Vol. 22, No. 4 (Fall, 1974), 22.

[77]Ronald T. Hyman, Ways of Teaching (Philadelphia: J. B. Lippincott Company, 1974), pp. 254-70.

[78]Mark Heyman, Simulation Games for the Classroom (Bloomington, Indiana: The Phi Delta Kappa Educational Foundation, 1975).

In California, G/S has been sanctioned in the 1971 State Framework for Social Studies. It is explained in this document, that G/S can be used with adolescents, high school students, and even graduate students. The framework, however, cautions that a teacher who plans to implement G/S should have had a great deal of experience as a G/S participant in order to understand the dynamics of the learning process. This way, G/S can be employed with maximum effectiveness and perhaps begin to meet the expectations of it as being a constructive learning method.[79]

CAREER EDUCATION AND G/S

Career education, due perhaps to its strong ties with the social studies, has moved with the trend toward stressing process and decision-making in a social milieu. Goldhammer, a leading career education proponent, believes that schools should be so structured as to simulate the kind of environment and social conditions under which individuals will ultimately live.[80] This comprehensive view of schooling has been set forth by DHEW in a handbook for national consideration, with specific mention of providing simulated career experiences for students.[81]

Simulated career experiences have been recommended by

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[79]California Statewide Social Sciences Study Committee, Social Sciences Education Framework for California Public Schools (Revised Draft; Sacramento: California State Department of Education, 1971), pp. 60-61.

[80]Stanley P. Wronski, "Career Education and Social Studies" (an interview with Keith Goldhammer), Social Education, Vol. 37 (October, 1973), 487.

[81]Maryland State Department of Education, op. cit., p. 43.

Johnson.[82] He cites the research conducted at Stanford by Krumboltz on occupational simulation kits as support for this approach. As mentioned previously, Hansen[83] approves the use of G/S, particularly the LCG, in career education and like Johnson, refers favorably to G/S materials developed by Krumboltz.

Roberts used a G/S approach to develop vocational awareness. He believes that the G/S method emphasizes the responsibility of the individual in constructing his personal value and moral system in relationship to his environment.[84]

The effect of G/S on achievement motivation and career development variables was studied by Carlson. His findings showed that significant differences in career maturity stemmed from utilization of various G/S techniques.[85]

The literature seems to indicate that a need for alternative instructional processes in career education has been recognized. It reflects that a movement of national proportions has begun in an attempt to answer these needs.

The State of California has also recognized this priority. The

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[82]Richard Gilmore Johnson, "Simulation Techniques in Career Development," American Vocational Journal, Vol. 45, No. 6 (September, 1970), 30-32.

[83]Hansen, op. cit., p. 246.

[84]Tommy L. Roberts, Gaming for Vocational Awareness: A Systems Approach. The Bartlesville System, Stillwater, Oklahoma: Oklahoma State University, 1970. (ERIC ED 037 754)

[85]Richard E. Carlson, Building a Psychological Career Awareness Model: A Field Study to Evaluate the Effectiveness of Achievement Motivation Simulation on Career Development, Washington, D.C.: District of Columbia Public Schools, 1972. (ERIC ED 068 712)

position paper on career education holds:

> Successful implementation of career education requires many changes in the traditional curriculum and organizational structure of the school. The major areas of change are curriculum content, instructional process, career guidance, and placement service.[86]

New instructional processes such as G/S may have a function in the California interpretation of the career education concept. Hirschinger and others have suggested that G/S has the scope and flexibility to be a viable part of California's career education curricula.[87]

THE LIFE CAREER GAME: A REVIEW OF RESEARCH

The Life Career Game is a G/S which has been used in educational programs prior to the career education movement and since its rise to national attention. A philosophical base for understanding the rationale for its use is found in Boocock's statement:

> Current educational philosophy of games is based upon a sociological analysis of American secondary education, in which certain structural defects are suggested: a rigid and non-functional reward system; a mismatching of time, with the school oriented toward future events and rewards which are meaningless to the adolescent student; and over-emphasis on the "judging" aspect of the teachers' role. Games with simulated environments are postulated as one means of correcting these defects.[88]

This philosophy became functional with the development of the LCG by Boocock in 1966.

Investigation of the potential of the LCG began in 1966.

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[86]California State Department of Education, op. cit., p. 18.

[87]Hirschinger et al., op. cit., p. 7.

[88]Sarane S. Boocock, "The Effects of Games with Simulated Environments upon Student Learning" (unpublished Doctor's dissertation, The Johns Hopkins University, 1966).

Varenhorst found it to be of value in helping three types of students: (1) high ability students performing below their ability, (2) a group of Negro students, (3) a group of students who were average to slightly below average in achievement. She also noted the positive effects of organizing boy-girl teams in terms of increased interest in the G/S activity.[89] No empirical data were included to support these impressions.

The LCG was originally designed to be used with students at the secondary level. Soon after its introduction, a modified version was prepared by Shirts to be evaluated with sixth grade students in California. No significant differences in career development between treatment and control groups were found, still, the LCG reportedly evoked a high degree of student interest.[90]

In 1967 Boocock reported on the more empirical field tests of the LCG. The evidence pointed to the benefits of: high student interest in the LCG; a realistic, if vicarious, environment in which decision-making can be practiced; and its value in communicating information of a factual nature.[91] Coleman likewise examined the LCG; he regarded it to be of value in increasing student awareness of social processes and subsequently supports its use in educational settings.[92]

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[89]Barbara B. Varenhorst, "The Life Career Game-Practice in Decision-Making," Simulation Games in Learning, eds. Sarane S. Boocock and E. O. Schild (Beverly Hills, California: Sage Publications, Inc., 1968), pp. 252-53.

[90]R. Garry Shirts, Career Simulation for Sixth Grade Students, San Diego, California: San Diego County Department of Education, 1966. (ERIC ED 010 076)

[91]Sarane S. Boocock, "The Life Career Game," Personnel and Guidance Journal, Vol. 46 (December, 1967), 328-34.

[92]Coleman, op. cit., pp. 29-51.

Conte followed up Shirts' study with a doctoral investigation of LCG use at the sixth grade level. The LCG group in his study demonstrated a significant increase in knowledge of life career planning as compared to a control group that engaged in unrelated game activity.[93] Another sixth grade level study by Lindblad in Sweden concluded that a G/S, adapted from the LCG, used in a career education counseling course increased verbal information and intellectual skills in decision-making. In addition, LCG type groups consulted more persons regarding their career plans and thought that career interests and intentions were more important in career planning than job qualifications.[94]

Student self-referral to the counseling office, and differential learning after the LCG treatment was tested by McHenry at the seventh and eighth grade levels. A second experimental group playing the Democracy Game and a no-treatment control group were included. No significant differences were found at the seventh grade level; however, there was a difference in the dependent variables at the eighth grade level. One of McHenry's recommendations was that efforts should be made to construct more comprehensive measures of student learning in the LCG.[95]

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[93]Anthony E. Conte, "Games with Simulated Environments: The Use of Life Career with Sixth Grade Students" (unpublished Doctor's dissertation, The Pennsylvania State University, 1968).

[94]Sverker Lindblad, "Simulation and Guidance: Teaching Career Decision-Making Skills in the Swedish Compulsory School," Simulation and Games: An International Journal of Theory, Design, and Research, Vol. IV, No. 4 (December, 1970), 429-39.

[95]William James McHenry, "A Study of the Use of the Life Career Game in Junior High School Group Guidance" (unpublished Doctor's dissertation, The George Washington University, 1969).

Junior high school students were also studied by Joyce who compared the LCG to traditional methods of teaching life career planning. The major conclusions of his study were: (1) the LCG is no more effective than traditional methods in assisting students to learn cognitive data; (2) simulation is more effective in changing attitudes towards the concepts of education, marriage and family life, and leisure; (3) simulation groups showed greater retention of data learned; (4) neither method was effective in improving critical thinking ability.[96]

Research at the ninth grade level yielded conflicting results. Johnson found that playing the LCG had no influence on ninth grade boys' and girls' awareness of life decisions, exploratory activity, or time estimate competency, although, retention of information was greater as in Joyce's study.[97] In a later related article, Johnson and Euler added that students in his original study did not perceive the LCG as an interesting activity.[98] This tends to diminish Boocock's main promotional point for the LCG. Counter to Johnson's conclusions, Mulherin, in his research, found that there was increased awareness of curriculum choices for above-average students who played the LCG as well as a change of values for females and more assumption of responsibility for above

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[96]John Francis Joyce, "A Comparison of the Methods of Teaching Life Career Planning to Junior High School Students" (unpublished Doctor's dissertation, North Texas State University, 1971).

[97]Richard H. Johnson, "Effect of the Life Career Game on Decision-Making Variables at the Ninth Grade Level" (unpublished Doctor's dissertation, University of Missouri, 1970).

[98]Richard H. Johnson and Delores E. Euler, "Effect of the Life Career Game on Learning and Retention of Educational-Occupational Information," The School Counselor, Vol. 19, No. 3 (January, 1972) 155-159.

average participants.[99]

Several studies were found on the application of the LCG at the high school level. Adams explored LCG influence on tenth graders and discovered that LCG students "appeared" to have used more definite decision-making processes, however, the overall analysis of covariance revealed no significant differences.[100]

Tolerance of ambiguity utilizing the LCG was studied by Selverstone using eleventh grade students. Partial success in increasing tolerance for ambiguity was revealed.[101] Groome tested the effect of the LCG on 578 eleventh grade students in nine Canadian high schools. The CMI was the instrument employed to measure the dependent variable of career maturity; it was administered in a 2-hour time block on the day following the treatment. The intervening variable of role-taking was also measured by other instruments. Groome's format of treatment consisted of participation in the LCG for one school day. All experimental groups completed at least four rounds of play of the LCG; one round corresponds to one year of the simulated person's life. The major conclusion of the study was that:

> Since there was no increase in career maturity after the simulation experience and since the experimental design had great power to detect small differences, therefore, it was concluded that

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[99]Brian C. Mulherin, "The Effects of Simulated Career Planning on the Vocational Maturity of Ninth Grade Youth" (unpublished Doctor's dissertation, University of Maine, 1971).

[100]Paul W. Adams, "The Effect of the Life Career Simulation Game Upon the Decision-Making Processes of Sophomore High School Students" (unpublished Doctor's dissertation, University of South Dakota, 1971).

[101]Robert Selverstone, "The Effects of Simulation Training in Decision-Making Upon Intolerance of Ambiguity and Decision-Making Ability" (unpublished Doctor's dissertation, New York University, 1971).

> if the simulation LIFE CAREER did affect the vocational development of subjects, the instrument used, CMI, was not an effective one to detect these differences. Conversely, if vocational development was accurately assessed by the CMI, then an experience in the simulation LIFE CAREER was not an effective method to increase career maturity.[102]

Other studies on the LCG used high school students from more than one grade level. For instance, Wickers combined sophomores, juniors and seniors to examine future time perspectives and locus of control. Students played the game of Democracy in the control groups. Wickers' results demonstrated partial support for the LCG in respect to increasing locus of control but no support for a positive influence on improvement of time perspective.[103] Garner ran a similar study with secondary students and found that students exposed to the LCG did not outperform students in the control groups who played various other games. It was conjectured that loss of interest and frustration with the LCG may have hindered the main effect of the game. Also, the hypotheses that low-achieving students are helped more than other students by G/S was not supported.[104]

Finally, Rhett was interested in the effect of the LCG on minority group students. He applied the LCG to a group of Black senior high school

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[102]Agnes Jean Groome, "Interaction Effects of Personological Variables in Dyads and Simulation Task Upon Role Taking and Career Maturity of Grade Eleven Students" (unpublished Doctor's dissertation, University of Colorado, 1973); see also Agnes Jean Groome, "Interaction Effects in Life Career Simulation: Sex and Ability of Role and Participants," Simulation and Games: An International Journal of Theory, Design and Research, Vol. VI, No. 3 (September, 1975), 317.

[103]Frank C. Wickers, "Future Time Perspective, Locus of Control and the Life Career Simulation Game" (unpublished Doctor's dissertation, University of Virginia, 1974).

[104]Robert Charles Garner, "Effects of a Simulation Learning Game on Student Attitudes and on the Learning of Factual Information" (unpublished Doctor's dissertation, New Mexico University, 1972).

males and hypothesized that their personal levels of autonomy; and educational, vocational and marital plans, would increase significantly as a result of participation. These hypotheses were not supported.[105]

Clearly, the research on the use of the LCG in educational settings has been varied in application and inconclusive in respect to its effectiveness. The optimism which Boocock has for the LCG has not been always supported by the conclusions of researchers. Student interest and satisfaction, for example, was negative in Johnson's study. Retention of cognitive material seemed to be a strength of the LCG worthy of notice in Johnson's as well as Joyce's study.

Perhaps the main purpose of the LCG is to raise the career maturity level of students. This main effect has not been demonstrated by the LCG as measured by the CMI at the eleventh and twelfth grade levels.

SUMMARY

The second chapter reviewed the literature and research which was pertinent to the study. Chapter 2 was divided into five main sections, (1) Career Planning Concerns of the General Population, (2) Career Education, (3) The Evolution of G/S as a Learning Method, (4) G/S in Education, (5) Research Using the Life Career Game.

It was suggested in the review of the literature that a need exists in the general population and particularly in the schools to assist individuals with their life career planning. The emerging concept of

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[105]William Paterson Rhett, Jr., "Effects of a Simulation Game on Autonomy and Life Career Planning of Black Senior High Males" (unpublished Doctor's dissertation, Auburn University, 1973).

career education was mentioned as a trend which may meet these career planning needs.

Career education, because it is in the process of definition and modification, is responsive to implementation of effective methods for assisting students. Altering the career maturity level of students is viewed as a primary objective of career education.

Gaming/Simulation was presented as a technique with a rich history of use in war games, business and the social sciences which illustrates potential as a learning method suitable for career education. G/S stresses process and allows for testing of reality. This characteristic seemingly is said to assist in the learning of more mature decision-making and courses of action.

The use of a specific G/S, the LCG, to affect various dependent variables was reviewed. Research on the dependent variable of career maturity was cited as an example of the way the LCG could be employed in career education.

Clear conclusions on the effect of LCG use at the eleventh and twelfth grade levels have not been reached. Further research is needed to obtain additional empirical information on the relationship between the LCG and career maturity as measured by the Career Maturity Inventory (CMI). The objective of this study is to provide such information.

Chapter 3

THE DESIGN AND PROCEDURE OF THE STUDY

This study investigated two techniques for teaching career planning to eleventh and twelfth grade students. One technique used a Gaming/Simulation (G/S) entitled the Life Career Game (LCG) and the other was a conventional technique employing a Didactic/A-V approach. A total of seven groups was designated to participate in the study at two high schools. Four experimental groups experienced the LCG and in three control groups a Didactic/A-V method was used. The Career Maturity Inventory (CMI) was the instrument selected to measure the dependent variable of career maturity.

The following sections concern the design and procedure of this investigation. The sections are: (1) setting of the study, (2) sample description, (3) treatment description, (4) instrumentation, (5) data collection procedures, (6) research hypotheses, (7) statistical procedures, and (8) summary.

SETTING OF THE STUDY

Two high schools located in separate California communities and school districts served as the settings for this study. One school, Lodi High School, had a student enrollment of 2,223.[1] It is situated in a

[1]Lodi Unified School District, Lodi High School Accreditation Report-Form C, March, 1976, p. 65.

rural-agricultural community which, according to the California Statistical Abstract of 1975, had an estimated population of 31,350.[2] The 1970 "non-white" composition of this community was approximately 2.8 percent Oriental, .25 percent Indian,[3] and .003 percent Black, and .54 percent categorized as "Other."[4]

The second school, Tracy High School, had a student enrollment of 1,864[5] and is also situated in a rural-agricultural community. The estimated population of this community in 1975 was 15,500.[6] In 1970, the racial-ethnic composition of the population was approximately 73.9 percent Caucasian, 24.4 percent Spanish surname, and 1.7 percent Black.[7]

Therefore, although both communities were rural-agricultural, the larger percentages of Spanish surname and Black populations in Tracy than in Lodi, as shown in Table 1, page 44, may indicate a different socio-educational milieu. Student learning and response to the instructional techniques tested may be influenced by this factor. Within the experimental and control groups comprising the study's sample, there

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[2]California, California Statistical Abstract - 1975 (Sacramento: State Document Section, 1973), p. 11.

[3]Since the original source did not differentiate American Indian from East Indian, it is assumed that the reference here is to American Indian. The precise categorization of racial-ethnic groups is limited by the purpose for which the data are to be utilized. Therefore, a comparison of sources with differing purposes should recognize this limitation.

[4]Lodi Unified School District, Official Statement-Lodi Unified School District-1975 School Bonds, p. 13.

[5]Data obtained from Tracy High School registrar.

[6]California, loc. cit.

[7]San Joaquin County, Housing--Tracy Planning Area, September, 1973, p. 3.

Table 1

Percentage of Minority Group Students at Lodi High School and Tracy High School

Percentage	Lodi High School[a]	Tracy High School[b]
American Indian	0.35	0.7
Asian American	3.0	1.6
Black	0.0	2.6
Spanish Surname	10.0	25.8
Total	13.35	31.0[c]

[a]Data calculated from Lodi High School Accreditation Report, Form C (Lodi Unified School District, March, 1976), p. 65.

[b]Data obtained from school profile, California Assessment Program, Profile of School District Performance, 1974-75 for Tracy Joint Union High.

[c]Total as reported in the school profile including .3 percent for some category not identifiable.

existed a similar distribution of racial-ethnic characteristics which served to control for this variable.

Table 2, page 46, depicts achievement levels and Table 3, page 47, shows background factors for the two schools. A perusal of these tables suggests that the school settings are similar. There is a slight difference in the level of academic achievement however the statistical methodology employed in the study controls for this variable in the sample. Due to restrictions on obtaining information on socioeconomic status and parent education it was not possible to control for these variables.

SAMPLE DESCRIPTION

The investigator approached both schools through contact with a school counselor involved in career education counseling. Approval for the study was given by the principals of both high schools.

The school counselor at Lodi High School arranged for three teachers to participate in the study; their classes were used to form the study's sample. Two of the teachers volunteered to conduct the experimental treatment in their respective class and one teacher consented to have his class become the control group. The two experimental groups were enrolled in the course titled "Individual in Society" and the control groups were taking the course titled "Government." These groups were comprised mainly of seniors, but a small number of juniors and sophomores were also enrolled. The groups were at similar academic achievement levels and were regarded by the teachers as "low academic achievers" or "non-college preparatory." All of the teachers had intended to include career education and planning in their courses before the study was

Table 2

Achievement Percentages and Percentile Ranks on Basic Skills at Lodi High School and Tracy High School[a]

Content areas	Percent correct		State percentile rank	
	Lodi H.S.	Tracy H.S.	Lodi H.S.	Tracy H.S.
Reading	74.3	71.9	75	53
Written Expression	55.5	53.6	60	44
Spelling	62.7	60.8	75	55
Mathematics	65.8	63.8	51	37

[a]California Assessment Program-Report on the Survey of Basic Skills-Grade 12--January 1974 (School Level Report--September, 1975--Amended and Final). Data amended and verified via telephone conversation with Dr. Taj Pandey, California State Department of Education, Office of Program Evaluation and Research, April 2, 1976.

Table 3

Socioeconomic and Parent Education Indices and Their State Percentile Ranks for Lodi High School and Tracy High School[a]

Background factors	School index		State percentile rank	
	Lodi H.S.	Tracy H.S.	Lodi H.S.	Tracy H.S.
Mean Socioeconomic Index[b]	1.40	1.20	55	37
Mean Parent Education Index[c]	1.90	2.00	35	50

[a]California Assessment Program-Report on the Survey of Basic Skills-Grade 12--January 1974 (School Level Report--September, 1975--Amended and Final). Data amended and verified via telephone conversation with Dr. Taj Pandey, California State Department of Education, Office of Program Evaluation and Research, April 2, 1976.

[b]Numerical code: 0 = unskilled, 1 = skilled and semiskilled, 2 = semiprofessional, 3 = professional.

[c]Numerical code: 1 = not a high school graduate, 2 = high school graduate, 3 = college graduate or advanced degree.

initiated.

The sample at Tracy High School consisted of four classes of juniors enrolled in "U.S. History." The classes were all taught by the same teacher and were at similar academic achievement levels. Two of the classes were designated as the experimental groups and two were designated as the control groups. The school counselor cooperating in the study conducted all experimental and control groups. The numerical composition of the experimental and control groups at both schools is presented in Figure 1, page 51.

TREATMENT DESCRIPTION

The treatment was conducted at Lodi High School on September 17, 18, 19, 22, 23, and 24, 1975 for both experimental and control groups. The investigator endeavored to assume the role of facilitator in the LCG groups until the teachers assumed the role. In one LCG group the investigator maintained this role for the duration of the experimental treatment with the teacher assisting. The control group was conducted entirely by the classroom teacher.

At Tracy High School, experimental and control treatments were conducted during November 3, 4, 5, 6, 7, and 10, 1975. The school counselor assumed the facilitator role in the experimental groups with the assistance of the regular classroom teacher. The control groups were also conducted by the school counselor with the assistance of the same teacher.

The Experimental Group

Treatment

The treatment which the experimental groups received consisted of

six class periods, ranging from forty-five to fifty minutes in length, in which a G/S entitled the Life Career Game (LCG) was played.[8] Boocock, the originator of this G/S, presents a general description of the LCG:

> The Life Career Game can be played by any number of teams, each consisting of two to four players. Each team works with a profile or case history of a fictitious person (usually about the age of the players). Play proceeds in rounds or decision periods, each of which represents one year in the life of this person. During each decision period, players plan their person's schedule of activities for a typical week, allocating his time among school, studying, a job, family responsibilities, and leisure activities. Most activities require certain investments--of time, training, money, and so on (for example, a full-time job takes a certain amount of time and often has some educational or experience prerequisites as well; similarly, having a child requires a considerable expenditure of time in addition to the financial expense). A person clearly cannot engage in all of the available activities. Thus the players' problem is to choose the combination of activities that they think will maximize their person's present satisfaction and his chances for a good life in the future. In addition, for certain activities--a job, or higher education--a person must make a formal application and be accepted.
>
> An integral feature of the Life Career Game is that in the normal course of playing, students acquire such skills as filling out college or job application forms correctly. This can make the game particularly valuable for children from "deprived" sectors of the community, where young people cannot learn these basic skills from their parents or other adults with whom they normally come into contact.
>
> When players have made their decisions for a given year, scores are computed in four areas--education, occupation, family life, and leisure. Calculators use a set of tables and spinners (based on U.S. Census and other national survey data) that indicate the probabilities of certain things happening in a person's life, given his personal characteristics, past experiences, and present efforts. A chance or "luck" factor is built into the game by the use of spinners and dice. (Thus a side effect of the game is that students can gain an understanding of some of the principles of probability theory through seeing how it operates in a concrete social situation.
>
> A game runs for a designated number of rounds (usually 10 or 12), and the team with the highest total score at the end is the winner.[9]

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[8]The use of the LCG requires careful preparation by the teacher or facilitator if it is to work with maximum efficiency. The investigator gained experience with the LCG by conducting a pre-study trial group in May of 1975.

[9]Sarane S. Boocock, "The Life Career Game," Personnel and Guidance Journal, Vol. 46, No. 4 (December, 1967), 329.

The Control Group Treatment

The control groups at both schools received a Didactic/A-V[10] treatment which was as similar to the experimental treatment as possible, in terms of content and time span. Because at Lodi High School career education was an on-going part of the two courses, and at Tracy High School it was primarily a one week unit, some differences in treatment procedures were necessary. At Lodi High School the control group was not conducted during six consecutive school days, as was the experimental group. The control group treatment was presented one day a week over a period of several weeks. It should also be noted that although the LCG experimental treatment was confined to six consecutive school days, some other career education topics and exercises, but not G/S type, were included in the course. This was a result of planning prior to the initiation of the study. Thus, differentiation and control of the experimental and control treatments were as rigid as the circumstances permitted. This variation could add to the generalization of the study because it is not always possible to conduct a new career education program without considering pre-existing priorities.

At Tracy High School, only one individual conducted both the experimental and control groups and this tended to allow for more control of the treatments than at Lodi High School. Both control groups received the same treatment during the same class days. The experimental LCG treatment was presented on the same class days as the control Didatic/A-V treatment. Figure 1 presents the details of the experimental procedure.

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[10]Didactic/A-V refers to the control group treatment consisting of lectures, conventional career-search inventories, and audiovisual approaches to career planning.

	Group	N	Pretest	Treatment	Posttest
Lodi H.S.	E_1	26	CMI[a]	LCG[b]	CMI[c]
	E_2	22	CMI	LCG	CMI
	C_1	17	CMI	DIDACTIC/A-V[d]	CMI
Tracy H.S.	E_3	27	CMI[e]	LCG[f]	CMI[g]
	E_4	18	CMI	LCG	CMI
	C_2	14	CMI	DIDACTIC/A-V[h]	CMI
	C_3	20	CMI	DIDACTIC/A-V	CMI

Figure 1

Experimental Procedure

[a]The Career Maturity Inventory (Attitude and Competence tests) administered September 11, 12, 15, and 16, 1975 to E_1 and E_2; September 16, 17, 18, and 19, 1975 to C_1.

[b]The Life Career Game conducted September 17, 18, 19, 22, 23, and 24, 1975 in E_1 and E_2.

[c]The Career Maturity Inventory (Attitude and Competence tests) administered December 16, 17, 18, and 19, 1975 to E_1, E_2, and C_1.

[d]Didactic/A-V approach used over several weeks by teacher.

[e]The Career Maturity Inventory (Attitude and Competence tests) administered October 23, 1975 to all groups.

[f]The Life Career Game conducted November 3, 4, 5, 6, 7, and 10, 1975 in E_3 and E_4.

[g]The Career Maturity Inventory (Attitude and Competence tests) administered January 14, 1976 to all groups.

[h]Didactic/A-V approach used by counselor on November 3, 4, 5, 6, 7, and 10, 1975 with C_2 and C_3.

Teacher Orientation to the Life Career Game

The school counselor and the teachers who conducted the LCG in the experimental groups were provided with an orientation to the use of G/S and specifically the LCG. Each was presented with a copy of the Phi Delta Kappa Fastback entitled Simulation Games for the Classroom.[11] They were asked to read this publication prior to the orientation session with the investigator.

The orientation session was two hours in length during which three areas were discussed: (1) a general overview of classroom simulations, (2) effective methods for directing simulations, particularly the LCG, and (3) the rules, materials, and procedures used in the LCG. Particular emphasis was given to explaining the classroom dynamics that are created by the LCG and ways of enhancing the experience.

INSTRUMENTATION

The testing instrument used in this study was the Career Maturity Inventory (CMI)[12] developed by John O. Crites. The CMI consists of an Attitude Scale (CMI-ATT), and a Competence Test (CMI-COMP). The CMI-ATT is a fifty item instrument which attempts to measure the following dimensions of an individual's career maturity:

1. Involvement in the choice process
2. Orientation towards work, that is pleasure or non-pleasure

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[11]Mark Heyman, Simulation Games for the Classroom (Bloomington, Indiana: The Phi Delta Kappa Educational Foundation, 1975).

[12]John O. Crites, Career Maturity Inventory (CMI) (Monterey, California: CTB/McGraw-Hill, 1973).

3. Independence in decision making
4. Preference for career choice factors
5. Conceptions of the choice process[13]

The reported reliability of the CMI-ATT scale in respect to internal consistency reveals a mean for r_{tt} = .74 and a specific r of .77 and .75 for grades 11 and 12 respectively in the standardization sample. Its stability, r = .71, falls within a range which indicates reliability while still allowing for maturational variance. Coefficients of equivalence for the CMI-ATT scale have not been determined because alternate forms of the scale are not yet available.[14] The content validity of the CMI-ATT as determined by the interjudge agreement method was 74 percent. Thus, it appears to have acceptable content validity. The criterion-related validity has some support although it is recommended that further research is needed for definitive conclusions to be reached. Construct validity, in respect to response bias, correlation with other variables, and experimental-interventive manipulations, is supported by the research.[15]

Section two of the CMI is the Competence Test (CMI-COMP) consisting of the following components:

Part 1. Knowing Yourself (Self-Appraisal)

Part 2. Knowing About Jobs (Occupational Information)

Part 3. Choosing A Job (Goal Selection)

Part 4. Looking Ahead (Planning)

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[13]John O. Crites, Career Maturity Inventory--Theory and Research Handbook (Monterey, California: CTB/McGraw-Hill, 1973), p. 12.

[14]Ibid., p. 14.

[15]Ibid., pp. 15-20.

Part 5. What Should They Do? (Problem Solving)

This section of the CMI is in the research phase of development. This limitation of the instrument should be recognized when interpreting the results of the study.

The American Psychological Association has enumerated three types of reliability estimates on which new instruments should be tested. Only internal consistency coefficients are presently available on the CMI-COMP. Generally, the KR 20's indicate that all five parts of the CMI-COMP are relatively homogeneous sets of items; therefore, it can be assumed that within a subtest the items measure essentially the same variable. As with reliability estimates, validity estimates for the CMI-COMP test have not been empirically completed. However, the strength of the rational methodology used in the construction of the test, preliminary empirical studies, and the test's wide use in educational settings seem to present sufficient credence for its use.[16]

RESEARCH HYPOTHESES

As was stated in Chapter 1, this study investigated the effect of two instructional techniques on the career maturity levels of eleventh and twelfth grade students enrolled in a career education course. The CMI, which consists of two main parts: (1) the Attitude Scale, and (2) the Competence Test, was used to measure the dependent variable of career maturity.

Therefore, two research hypotheses were explored in this study. They are as follows:

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[16]Ibid., pp. 30-35.

1. Students who participate in the LCG method show greater gains in career attitudes than students who participate in the Didactic/A-V method.

2. Students who participate in the LCG method show greater gains in career competence than students who participate in the Didactic/A-V method.

DATA COLLECTION PROCEDURES

During the class period prior to the first testing session the investigator spoke to all the experimental and control groups to explain the general nature of the study and to enlist the students' cooperation. They were informed that the testing would not affect their grades and that they could discuss the results with the investigator, the school counselor, or their teacher.

The CMI pretest was administered at Lodi High School by the investigator during regular class periods of 50 minutes each. This testing took approximately three and one-half class periods, allowing for absences and make-up time, which corresponded to the time of 2½ hours recommended in the CMI Administration and Use Manual for the complete administration.

The two experimental groups were tested on September 11, 12, 15, and 16, 1975; the control group was tested on September 16, 17, 18, and 19. This difference in testing dates was necessary because the investigator was conducting all of the testing.

The posttest was administered by the investigator during the second week in December, 1975, three months after the pretest. It was again conducted during regular class periods and for a similar period of time as the pretest.

The pretest of the CMI was administered to all students in the junior class at Tracy High School in one block session, 8:10-11:00 A.M.,

on October 23, 1975. The administration was conducted by the school psychologist with the investigator and school staff assisting.

The posttest was administered in a similar block session three months after the pretest on January 14, 1976. The time lapse between the pretest and the posttest was approximately three months for both schools in the study.

STATISTICAL PROCEDURES

A Nonrandomized Control-Group Pretest-Posttest Design was utilized in this study in order to obtain data relevant to the research questions. Since it was not feasible to randomly assign the participants to the treatment groups, this design was deemed adequate. Isaac and Michael recommend that preassembled groups which are as similar as availability permits, be selected and their pretest means and standard deviations compared for similarity.[17] In regard to this design, they further state:

> . . . [The design has] some practical advantages, since it deals with intact classes and does not interrupt the school's program. By involving a wide variety of classes from several settings it is possible to achieve an even higher degree of external validity.[18]

Thus, the CMI was given as a pretest to all of the groups, both experimental and control. Following the pretest was the LCG treatment which was presented to the experimental groups whereas the control groups received the conventional Didactic/A-V approach to career education. All of the groups then were given the CMI as a posttest approximately three

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[17]Stephen Isaac and William B. Michael, Handbook in Research and Evaluation (San Diego, California: Robert R. Knapp, Publisher, 1974), p. 43.

[18]Ibid.

months after the pretest. Figure 2 presents the basic design used in the study.

	Pretest	Treatment	Posttest
Experimental Groups	CMI	LCG	CMI
Control Groups	CMI	Didactic/A-V	CMI

Figure 2

Research Design for the Study

The analysis of covariance was selected as the statistical method optimally responsive to the research design employed. As mentioned previously, groups selected for research are compared on the basis of pretest scores to detect initial similarities or differences. As Isaac and Michael note:

> Many times in studies of the type suitable for analysis of variance, there will be initial differences between groups on pretest criteria that arise either by chance or, more likely, because of the inability of the educational researcher to select subjects at random. This includes sets of data that are not independent, involving correlated means. Analysis of covariance [italics in the original] adjusts for the initial differences between groups and for the correlation between means.[19]

Roscoe has made these comments in reference to analysis of covariance (ANCOVA):

> The use of analysis of covariance ordinarily involves a pretest (the variable to be controlled) and a posttest (the criterion) that are known to be correlated. . . . In some circumstances, it may be completely appropriate to use the same instrument for both pretest and posttest.[20]

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[19]Ibid., p. 141.

[20]John T. Roscoe, Fundamental Research Statistics for the Behavioral Sciences (New York: Holt, Rinehart and Winston, Inc., 1969), pp. 254-55.

Therefore, the scores on the CMI were analyzed to detect pretest and posttest variance in order to determine the effect, if any, of the LCG treatment in contrast to the Didactic/A-V treatment. The computer analysis of these data was conducted on a Burroughs B-6700 at the University of the Pacific. An alpha level of .05, using a two-tailed test of significance, was chosen as appropriate for the study.

SUMMARY

This study explored the effect of Gaming/Simulation (G/S) as a learning method in a high school career education course. A G/S entitled the Life Career Game (LCG) was compared to a conventional Didactic/A-V technique in respect to its effect on the career maturity level of eleventh and twelfth grade students.

The study was conducted in two high schools in separate California communities and school districts. Both communities were classified as rural-agricultural. One control group and two experimental groups were established in one school from students enrolled in twelfth grade social science courses which included career education. At the second school, two control groups and two experimental groups were designated from eleventh grade students also enrolled in a social science course with a career education unit.

Analysis of Covariance (ANCOVA) was utilized to analyze differences on Career Maturity Inventory (CMI) scores in a Nonrandomized Control-Group Pretest-Posttest Design. An alpha level of .05 was used with a two-tailed test of significance.

Chapter 4 will present the analysis of the data. The hypotheses are presented and considered in view of the test data.

Chapter 4

ANALYSIS OF THE DATA

INTRODUCTION

This study investigated the effectiveness of Gaming/Simulation (G/S) as a learning method in an high school career education course. A G/S entitled the Life Career Game (LCG) was contrasted with a conventional method of Didactic/A-V with respect to its effect on certain dimensions of the dependent variable of career maturity.

The two schools used in the study were situated in separate rural-agricultural communities and school districts. Students in eleventh and twelfth grade social science courses which included a career education component comprised the sample. Four experimental groups experienced the LCG technique and three control groups were exposed to the conventional Didactic/A-V approach. As noted in Chapter 3, all treatments, with the exception of one control group at Lodi High School took place over a period of approximately six consecutive class periods. The sample sizes for the experimental and control groups students completing the pretest and posttest of the Career Maturity Inventory (CMI) are presented in Table 4, page 60.

The research model was a Nonrandomized Control-Group Pretest-Posttest Design. The time lapse between the pretest and the posttest was approximately three months. This interval was the maximum possible and was intended to allow for long term effects of the treatments.

Table 4

Number of Students in Control and Experimental Groups at Lodi High School and Tracy High School Completing Pretest and Posttest Components of the CMI

School	Sample sizes for control groups					
	Attitude section	Competence section				
		1	2	3	4	5
Lodi High School	17	17	15	15	13	12
Tracy High School	34	34	34	34	34	34
Total	51	51	49	49	47	46
	Sample sizes for experimental groups					
	Attitude section	Competence section				
		1	2	3	4	5
Lodi High School	48	47	43	38	33	28
Tracy High School	45	45	44	44	44	44
Total	93	92	87	82	77	72

Scores on the CMI were compared on the basis of the learning method utilized. An alpha level of .05 with a two-tailed test of significance was employed using analysis of covariance (ANCOVA) as the basic statistical procedure. Supplementary classificatory variables designated as (1) age, (2) verbal ability level, (3) ethnic group, (4) school, and (5) sex were also considered. No significant differences between these supplementary classificatory variables were identified by the analysis of variance (ANOVA) procedures. Thus, it was concluded that the experimental and control groups were basically similar in these areas. Table 5, page 62, presents the ANOVA results relating to these variables.

CAREER ATTITUDE

The first null hypothesis was:

> Students who participate in the LCG method show similar gains in career attitudes when compared with students who participate in the Didactic/A-V method.

The CMI Attitude Test (CMI-ATT) served as the instrument to measure this variable. Table 6, page 63, presents the ANCOVA summary data for the first null hypothesis. Since F was computed to be only .061 and the critical value required to reject the null hypothesis was 3.84, the null hypothesis was retained as tenable. There is no justification to conclude therefore, that either method is superior in this regard.

CAREER COMPETENCE

The second null hypothesis was:

> Students who participate in the LCG show similar career competence when compared with students who participate in the Didactic/A-V method.

Table 5

Analysis of Variance F-Ratios Between the Experimental and Control Groups on Designated Independent Variables

Source	Age level	Verbal ability[a]	Ethnic Group	Sex
Lodi High School	N = 65 F = 0.280	N = 55 F = 1.887	N.A.[b]	N = 65 F = 0.054
Tracy High School	N = 79 F = 0.061	N = 66 F = 3.353	N = 79 F = 0.017	N = 79 F = 2.139
Entire Sample	N = 144 F = 1.128	N = 121 F = 1.931	--	N = 144 F = 1.867

[a]Verbal ability level measured by the Differential Aptitude Test.

[b]N.A. indicates that the ethnic variable data were not available and that the number of students in this category was insufficient.

Table 6

Summary of Analysis of Covariance Between Experimental and Control Groups for Career Attitude Scores

Source	Sum of squares	df	Mean square	F[a]	P
Between Methods	.78	1	.78	.061	>.05
Between Schools	1.93	1	1.93	.152	>.05
Methods X School	.34	1	.34	.027	>.05
Error	1756.94	139	--	--	--

[a]An $F \geq 3.84$ was required for significance at the .05 level.

The CMI Competence Section (CMI-COMP) measures five dimensions of career competence. These are: Part 1--Knowing Yourself (Self-Appraisal), Part 2--Knowing About Jobs (Occupational Information), Part 3--Choosing A Job (Goal Selection), Part 4--Looking Ahead (Planning), and Part 5--What Should They Do? (Problem Solving). The five parts of the test are analyzed separately in reference to the hypothesis.

Table 7, page 65, presents the ANCOVA data for Part 1. These data suggest that no significant changes in this variable occurred in the experimental or control groups. An F score of only 0.847 was obtained whereas a value of 3.84 was required for significance at the .05 level.

A difference between the schools which was significant at the .05 level was found on the Self-Appraisal section. Tracy High School students in all groups scored significantly higher than Lodi High School students. The adjusted treatment means for this part are given in Table 8, page 66. The table can be interpreted as indicating that if both schools had the same pretest mean, the posttest means would have been given by the adjusted means of 12.1 for Lodi and 13.59 for Tracy. This difference could perhaps be explained by the higher degree of treatment consistency and control possible in the Tracy sample.

Part 2 tests competence in the area of occupational information. ANCOVA results for this part of the CMI are shown in Table 9, page 67. No significant differences are indicated by the data.

Part 3 of the CMI-COMP measures competence in goal selection. Table 10, page 68, summarizes ANCOVA results for this part of the CMI-COMP. Significant results are found only in respect to the school variable. Again, Tracy High School scored significantly higher as the 4.633 F value seems to indicate. A more detailed examination of this

Table 7

Summary of Analysis of Covariance Between Experimental and Control Groups for Competence Section-- Part 1 (Self-Appraisal)

Source	Sum of squares	df	Mean square	F[a]	P
Between Methods	5.2	1	5.2	0.847	>.05
Between Schools	53.5	1	53.5	8.608	<.01
Methods X School	7.7	1	7.7	1.239	>.05
Error	857.68	138	6.21	--	--

[a]An $F \geq 3.84$ was required for significance at the .05 level.

Table 8

Adjusted Treatment Means for CMI Competence Section--Part 1 (Self-Appraisal)

	Lodi High School	Tracy High School
Means of the Covariate (Pretest)	12.391	14.127
Means of the Dependent Variable (Posttest)	11.406	14.177
Adjusted Posttest Means[a]	12.130	13.591

[a]The pooled regression coefficient was b = .7546.

Table 9

Summary of Analysis of Covariance Between Experimental and Control Groups for Competence Section-- Part 2 (Occupational Information)

Source	Sum of squares	df	Mean square	F[a]	p
Between Methods	1.00	1	1.00	0.136	>.05
Between Schools	18.8	1	18.8	2.52	>.05
Methods X School	.02	1	.02	0.001	>.05
Error	977.528	131	7.46	--	--

[a]An $F \geq 3.84$ was required for significance at the .05 level.

Table 10

Summary of Analysis of Covariance Between Experimental and Control Groups for Competence Section-- Part 3 (Goal Selection)

Source	Sum of squares	df	Mean square	F[a]	P
Between Methods	7.61	1	7.61	1.054	>.05
Between Schools	33.44	1	33.44	4.633	<.05
Methods X School	0.1	1	0.1	0.015	>.05
Error	909.52	126	7.22	--	--

[a]An $F \geq 3.84$ was required for significance at the .05 level.

difference is provided by Table 11, page 70, which shows the adjusted treatment means.

Another difference was found in the independent variable of sex. Females in the experimental groups scored higher than males in the experimental groups. An F value of 7.31 was obtained, which was significant at the .05 level, and apparently indicates that females responded better to the experimental treatment than males as far as Part 3 was concerned. Tables 12 and 13, on pages 71 and 72 respectively, present the data for this segment of the investigation.

Part 4 involves competence in the dimension of career planning. Table 14, page 73, shows the ANCOVA data for this variable. A significant result was evident with respect to the method and school interaction. An F-ratio of 4.2 seems to indicate that the experimental group at Tracy High School exceeded the control groups on Part 4. Further detail on this difference is provided by Table 15, page 74, which gives the adjusted treatment means, and Figure 3, page 75, which graphs this difference.

Part 5, which tests problem solving, also tends to indicate the presence of an interaction effect of the method and school. An F-ratio of 6.49 was obtained on this variable with the implication being that the experimental groups at Tracy High School scored higher than the control groups at that school. Table 16, page 76, presents this finding. No other significant differences are suggested by the data. This difference is clarified by the inclusion of Table 17, page 77, which presents the adjusted treatment means, and of Figure 4, page 78, which illustrates this difference in the adjusted means.

Caution should be exercised when interpreting these findings for Parts 4 and 5. The declining number of students who completed the last

Table 11

Adjusted Treatment Means for CMI Competence Section--Part 3 (Goal Selection)

	Lodi High School	Tracy High School
Means of the Covariate (Pretest)	12.660	13.936
Means of the Dependent Variable (Posttest)	12.226	14.218
Adjusted Posttest Means[a]	12.769	13.849

[a]The pooled regression coefficient was b = .7143.

Table 12

Analysis of Variance for CMI Gain Scores Between Males and Females in Experimental Groups on Competence Section--Part 3 (Goal Selection)

Source	Sum of squares	df	Mean square	F[a]	P
Sex	59.899	1	59.899	7.315	>.01
Within Groups	655.222	80	8.190	--	--
Total	715.122	81	--	--	--

[a]An F ≧ 3.96 was required for significance at the .05 level.

Table 13

Gain Scores for Males and Females in Experimental Groups on Competence Section--Part 3 (Goal Selection)

Source	Sum of squares	Mean	Standard deviation	N
Males	271.222	-0.722	2.784	36
Females	384.000	1.000	2.921	46
Total	655.222	0.244	2.971	82

Table 14

Analysis of Covariance Summary for CMI Competence Section--Part 4 (Planning)

Source	Sum of squares	df	Mean square	F[a]	P
Between Methods	22.36	1	22.36	1.682	>.05
Between Schools	6.25	1	6.25	0.47	>.05
Methods X School	55.83	1	55.83	4.2	<.05
Error	1581.43	119	13.289	--	--

[a]An $F \geq 3.92$ was required for significance at the .05 level.

Table 15

Adjusted Treatment Means by Method and School for CMI Competence Section-- Part 4 (Planning)

	Experimental		Control	
	Lodi	Tracy	Lodi	Tracy
Means of the Covariate (Pretest)	12.697	14.409	11.923	15.212
Means of the Dependent Variable (Posttest)	12.242	15.341	12.308	13.636
Adjusted Posttest Means[a]	12.940	15.048	13.453	12.897

[a]The pooled regression coefficient was b = .5786.

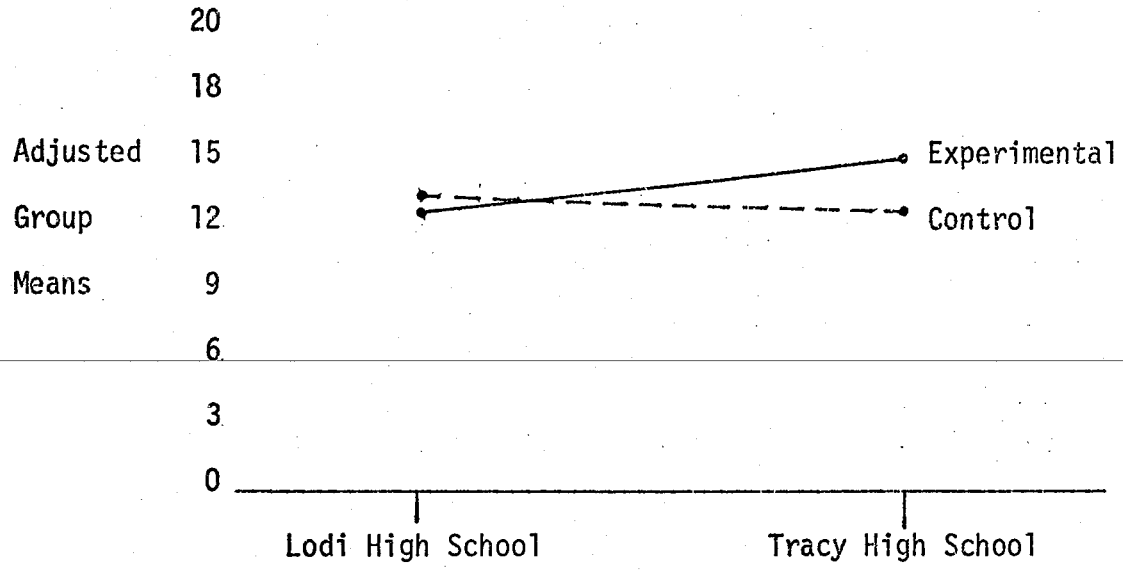

Figure 3

Adjusted Means for Experimental and Control Groups on CMI Competence Section--Part 4 (Planning)

Table 16

Analysis of Covariance Summary for CMI Competence Section--Part 5 (Problem Solving)

Source	Sum of squares	df	Mean square	F[a]	P
Between Methods	13.52	1	13.52	2.413	>.05
Between Schools	4.97	1	4.97	0.887	>.05
Methods X School	36.39	1	36.39	6.49	<.05
Error	633.48	113	5.606	--	--

[a]An $F \geq 3.92$ was required for significance at the .05 level.

Table 17

Adjusted Treatment Means by Method and School for CMI Competence Section-- Part 5 (Problem Solving)

	Experimental		Control	
	Lodi	Tracy	Lodi	Tracy
Means of the Covariate (Pretest)	8.643	11.182	9.167	10.500
Means of the Dependent Variable (Posttest)	8.786	12.000	9.583	9.588
Adjusted Posttest Means[a]	9.682	11.414	10.174	9.400

[a]The pooled regression coefficient was b = .5839.

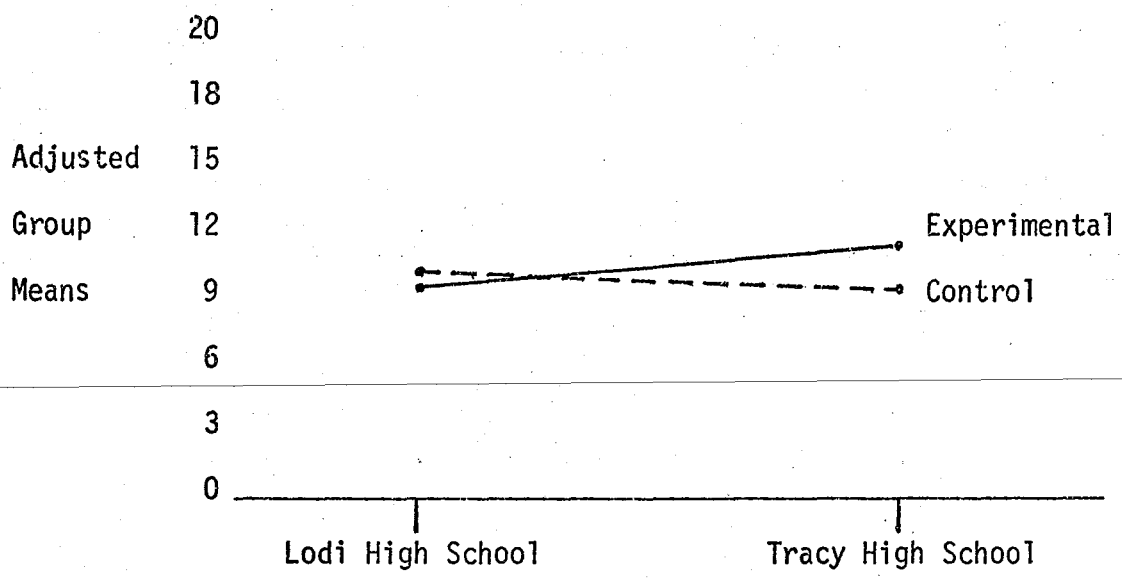

Figure 4

Adjusted Means for Experimental and Control Groups on CMI Competence Section--Part 5 (Problem Solving)

two parts of the CMI-COMP may decrease the generalizability of these results. There was a differential attrition rate with Tracy High School having only approximately 3 percent, whereas the rate at Lodi High School was in excess of 30 percent as is depicted in Table 4, page 60.

These data tend to identify the school as a significant factor in the study. The control possible at one of the sites could account for the differences obtained. A clear indication of differential effects of experimental and control groups apart from the interaction effects was not found. It is interesting to observe, however, that in the gain score analysis for Parts 1 through 4 of the CMI the experimental groups' scores were somewhat higher than the control groups' in every case, although not significantly so.

SUMMARY

Chapter 4 discussed an analysis of the research data. Two hypotheses regarding the effect of two learning methods on the career maturity level of high school students were tested. The experimental treatment, a Gaming/Simulation (G/S) entitled the Life Career Game (LCG), was compared with a conventional Didactic/A-V treatment to determine the effect on scores of the Career Maturity Inventory (CMI).

The analysis of covariance (ANCOVA) procedures was performed utilizing pretest and posttest CMI scores. The .05 level of significance was adopted for a two-tailed test of the null hypotheses.

The first research hypothesis stated:

> Students who participate in the LCG method show greater gains in career attitudes than students who participate in the Didactic/A-V method.

The data on the CMI Attitude Section (CMI-ATT) did not support

this hypothesis. No significant differences between student scores in the experimental and control groups were revealed.

The second research hypothesis stated:

> Students who participate in the LCG method show greater gains in career competence than students who participate in the Didactic/A-V method.

The Competence Section of the CMI (CMI-COMP) was used to test this hypothesis. The five parts of this section are (1) Knowing Yourself (Self-Appraisal), (2) Knowing About Jobs (Occupational Information), (3) Choosing A Job (Goal Selection), (4) Looking Ahead (Planning), and (5) What Should They Do? (Problem Solving).

Significant results were indicated for Parts 1 and 3 on the school variable with all groups at Tracy High School scoring higher. Part 3 also had an interaction effect on the method and sex variables with females in all experimental groups scoring higher than males in those groups. Parts 4 and 5 showed similar interaction effects on the school and method variables. Experimental groups at Tracy High School scored higher on these parts than control groups at this school, even though the F value for verbal ability approached significance and suggests that the control groups had more ability on this variable.

The results for Parts 4 and 5 should be viewed with caution. These parts of the CMI were completed by a lower number of students resulting in a testing attrition rate of approximately 3 percent for Tracy High School and 30 percent for Lodi High School.

Chapter 5 presents a summary of the study. Conclusions based on the data analysis and recommendations for further research are discussed.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

Career education has emerged as a national effort to prepare individuals for meaningful career and life experiences. New approaches to learning career awareness and competencies are needed if the goals of the career education movement are to be realized.

The experimental research in this study focuses on the use of Gaming/Simulation (G/S) as a learning method in a high school career education course. A G/S entitled the Life Career Game (LCG) was contrasted to a more conventional Didactic/A-V approach to career education. The effect of these two methods on the career maturity level of high school students was analyzed. Chapter 5 presents (1) a summary of the study, (2) conclusions regarding the hypotheses, (3) implications of the research, and (4) recommendations for further research.

SUMMARY OF THE STUDY

This study is summarized in three sections. First, the setting and sample characteristics are described; second, the research procedure is explained; and finally, the methodology and statistical procedure are presented.

The Setting and Sample Characteristics of the Study

The study was conducted in two high schools located in separate school districts and in rural-agricultural communities in California. Both schools had an enrollment of approximately 2,000 students. One of the schools contained a relatively larger percentage of minority students than the other school.

The experimental groups were comprised of a total of four classes between the two schools. In one school the classes were mainly seniors enrolled in a course entitled "Individual in Society." At the second school the groups were juniors registered in a "U.S. History" course. These experimental groups experienced a G/S entitled the Life Career Game (LCG) which was designed to assist students in career decision-making and planning. A total of ninety-three students was in the experimental group sample.

The control groups consisted of three classes which participated in a Didactic/A-V approach to career education at the two schools. A class of seniors taking the course "Government" was designated as the control group at the first school. The second school had two control groups designated, and these were two classes of juniors in the "U.S. History" course. The control sample totaled fifty-one students.

The Career Maturity Inventory (CMI) was administered as a pretest and posttest to the students in the experimental and control groups as a measure of career maturity level. Not all students in the sample completed pre and posttesting on all parts of the CMI. The attrition rate was approximately 3 percent for Tracy High School and 30 percent for Lodi High School.

The Procedure of the Study

The CMI was administered at Lodi High School as a pretest in mid-September, 1975 to the experimental and control groups. Following the pretest, the experimental groups participated in the LCG for six class periods. The control group experienced the Didactic/A-V approach for approximately the same amount of time, but spaced over the remainder of the term. The CMI posttest was administered approximately three months later in mid-December to maximize long-term treatment effects.

The pretest of the CMI was taken by the students at Tracy High School on October 23, 1975. The experimental groups played the LCG over six class periods commencing the first week in November. The control groups were exposed to the Didactic/A-V treatment during the same days. The CMI posttest was administered on January 14, 1976, as with Lodi High School, three months after the pretest.

Research Design and Statistical Methodology of the Study

The CMI was used to measure changes on several dimensions of the dependent variable of career maturity. The CMI is comprised of two main sections. Section One is the Attitude Section (CMI-ATT). Section Two is the Competence Section (CMI-COMP) which has five separate tests to measure various aspects of career competence. The experimental and control groups comprised the experimental variable while supplementary variables such as age, DAT verbal score, ethnic group, sex, and school were also analyzed with respect to the CMI scores and group membership.

A Nonrandomized Control-Group Pretest-Posttest research design was employed. The statistical method selected for use was analysis of covariance. An alpha level of .05 with a two-tailed test of significance

was adopted as the criterion of retention or rejection of the null hypotheses.

CONCLUSIONS RELATING TO THE HYPOTHESES

The essential purpose of this investigation was to explore the effect of a G/S technique, the Life Career Game (LCG), on the career maturity level of high school students. The G/S approach was contrasted to the more conventional Didactic/A-V method of career education.

Hypothesis Relating to Career Maturity Attitude

Research hypothesis one stated:

> Students who participate in the LCG method show greater gains in career attitudes than students who participate in the Didactic/A-V method.

This hypothesis was not supported by the findings of this study. The data failed to show that the methods were differentially effective on the CMI Attitude Section. Nor were changes in career attitudes associated with the other designated independent variables: (1) age, (2) verbal ability level, (3) ethnic group, (4) school, or (5) sex.

Hypothesis Relating to Career Competencies

Research hypothesis two stated:

> Students who participate in the LCG method show greater gains in career competence than students who participate in the Didactic/A-V method.

The five parts of the CMI Competence Section with the findings for these parts are as follows:

Part 1-Knowing Yourself (Self-Appraisal)

The data did not indicate that this competency area was

significantly increased by participation in the experimental groups. A significant F value was found for the school variable which indicated that Tracy High School students scored higher than Lodi students.

Part 2-Knowing About Jobs (Occupational Information)

No significant increase in CMI scores for this part was revealed by the experimental groups nor was there any interaction reflected by the independent variables.

Part 3-Choosing A Job (Goal Selection)

Statistical significance was not reached by experimental groups as contrasted with control groups. However, Tracy students achieved higher scores generally than did Lodi students. Also, within the experimental groups as a whole, the female students scored significantly higher than the male students at both schools.

Part 4-Looking Ahead (Planning)

A main differential treatment effect was not shown by the data on this part. However, an interaction effect between method and school indicated that experimental group students at Tracy High School scored higher than control group students at that school.

Part 5-What Should They Do? (Problem Solving)

As in Part 4, no main treatment differences were revealed although there was a significant interaction effect between method and school. Students in the experimental groups at Tracy again scored higher than students in the control groups. These results should be analyzed with the knowledge that the testing attrition rate for Lodi High School was approximately 30 percent while Tracy's rate was only about 3 percent which limits how one may generalize from them.

IMPLICATIONS OF THE STUDY

The findings of this study do not clearly indicate that the use of a G/S technique, the Life Career Game (LCG) will significantly affect cognitive and affective dimensions of career maturity to a greater degree than a Didactic/A-V method. Two parts of the CMI, Part 4 (Planning) and Part 5 (Problem Solving), supported the research hypothesis which predicted higher scores on the Competence Section for the experimental

groups, but these results were limited to one school. That particular school, Tracy High School, also had higher scores in control and experimental groups on Part 1 (Self-Appraisal) and on Part 3 (Goal Selection) than did the Lodi sample. As reported previously, greater control of the experimental and control treatments was possible at Tracy as one individual was conducting all of the groups whereas at Lodi three teachers were involved in the treatment groups. Thus, one could say that the way in which the career education program was implemented may have had an effect on the dependent variables.

Another significant difference appeared to exist between females and males in the overall experimental groups. Females scored higher in Part 3 (Goal Selection). It is difficult to explain this difference.

The student reaction to the administration of the CMI also merits consideration. The fatigue produced by the length of the CMI components, coupled with the high attrition rate at Lodi High School, may have had an influence on the data. Especially when one notices that the significant effects were most strongly associated with the last two parts of the CMI when most students were experiencing fatigue, both physical and psychological.

The failure to find more significant differences is likely to be seen as a limiting factor in the implementation of G/S. Therefore, cognizance should be made of the fact that neither learning method could be associated with important changes in the CMI scores.

Boocock[1] has recommended the LCG on the basis that it develops

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[1]Sarane S. Boocock, "The Life Career Game," Personnel and Guidance Journal, Vol. 46 (December, 1967), 328-34.

the decision-making process of students, provides career information, enables low-achieving students to experience success, and that students are enthusiastic about participating in such a G/S. Hansen[2] has also supported the use of the LCG in career education programs on similar grounds. Based on the CMI results and on observations of student response, the investigator has reservations about such beliefs of LCG effectiveness.

The CMI data in this study generally concur with the findings of Adams,[3] who reported that the overall analysis of covariance in his study revealed no significant effect of the LCG. As in the present study, the CMI was used in Groome's[4] investigation of the LCG. No significant effects of the LCG were reported. In her study the CMI was administered the day following the LCG treatment which tended not to allow for possible long-term effects of the treatment. Such a consideration was planned in the current study by administering the posttest three months after the treatment. Still, little significant change appeared to result.

McHenry[5] has recognized the need for a comprehensive measure of

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[2]L. Sunny Hansen, "A Model for Career Development Through Curriculum," Personnel and Guidance Journal, Vol. 51, No. 4 (December, 1972), 246.

[3]Paul W. Adams, "The Effect of the Life Career Simulation Game Upon the Decision-Making Processes of Sophomore High School Students" (unpublished Doctor's dissertation, University of South Dakota, 1971).

[4]Agnes Jean Groome, "Interaction Effects of Personological Variables in Dyads and Simulation Task Upon Role Taking and Career Maturity of Grade Eleven Students" (unpublished Doctor's dissertation, University of Colorado, 1973); see also Agnes Jean Groome, "Interaction Effects in Life Career Simulation: Sex and Ability of Role and Participants," Simulation and Games: An International Journal of Theory, Design and Research, Vol. VI, No. 3 (September, 1975), 312-19.

[5]William James McHenry, "A Study of the Use of the Life Career Game in Junior High School Group Guidance" (unpublished Doctor's dissertation, The George Washington University, 1969).

student learning with the LCG. Perhaps the CMI was designed to answer such a need but may fall short of this objective. This study seems to provide credence to Groome's ideas that if the LCG did in fact affect the career maturity of students, then the CMI was not sensitive enough to measure such changes.[6] However, it should be noted that the CMI, particularly the CMI-COMP, is still in the research phase. Krumboltz[7] has reported that the Educational Testing Service is presently in the process of designing a new instrument to evaluate career education variables so perhaps a more sensitive instrument may be forthcoming. After using the CMI to measure a career education program, Greene[8] recommends that school districts also design their own instruments to measure career education attitude changes. The use of the CMI for program evaluation should be carefully weighed by those conducting research in this area. Some researchers use only parts of the CMI to avoid the fatigue factor mentioned previously.

It seems important to recognize that the domain of knowledge and learning which is possible during the course of playing the LCG is very wide. Each profile in the LCG may offer variant opportunities to learn about a career dimension. Teams using identical profiles may approach the problem differently and therefore not complete the LCG with similar

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[6]Groome, op. cit., p. 317.

[7]John D. Krumboltz, of the Center for Advance Study in Behavioral Sciences, in a conversation at the American Educational Research Association Annual Meeting, April 20, 1976.

[8]Stanley Dee Greene, "The Relationship Between a Developing Career Education Program and the Career Maturity of Secondary School Students" (unpublished Doctor's dissertation, Kansas State University, 1973).

perceptions or knowledge.

Varenhorst[9] has said that low-achieving students and/or minority group students would respond well to the LCG. The present study did not suggest agreement with such a notion and therefore tends to concur with Garner's[10] work and Rhett's[11] study which negated such benefits of the LCG.

The evaluation of student enjoyment and interest in the LCG, as mentioned previously, has been evaluated by several researchers. These factors were of concern to the investigator in the present study. Garner[12] reported that students became frustrated while playing the LCG. Johnson and Euler[13] also claimed that the LCG was not regarded as an interesting activity by the students.

The perceptions of the LCG by students in this study tend to generally agree with Garner's, and Johnson and Euler's observations. Student enthusiasm for the LCG was much less than expected by the investigator. In one group the student frustration level was so high that the LCG was

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[9]Barbara B. Varenhorst, "The Life Career Game-Practice in Decision-Making," Simulation Games in Learning, eds. Sarane S. Boocock and E. O. Schild (Beverly Hills, California: Sage Publications, Inc., 1968), pp. 252-53.

[10]Robert Charles Garner, "Effects of a Simulated Learning Game on Student Attitudes and on the Learning of Factual Information" (unpublished Doctor's dissertation, New Mexico University, 1972).

[11]William Paterson Rhett, Jr., "Effects of a Simulation Game on Autonomy and Life Career Planning of Black Senior High Males" (unpublished Doctor's dissertation, Auburn University, 1973).

[12]Garner, loc. cit.

[13]Richard H. Johnson and Delores E. Euler, "Effect of the Life Career Game on Learning and Retention of Educational-Occupational Information," The School Counselor, Vol. 19, No. 3 (January, 1972), 155-59.

almost abandoned. However, some students did appear to have felt a sense of accomplishment by persevering and ultimately gaining insight into the complexities of the process. Negative student comments such as "Are we playing that dumb game again!" were sometimes balanced by positive comments such as "Gee! I didn't know it was so important to plan leisure time too!" It is interesting that the LCG group which was judged by the investigator to have enjoyed it most fully was a pre-study trial group conducted at another school. This was a volunteer group of higher ability students which was varied sexually and ethnically. They were able to leave their regular classroom for the LCG which probably enhanced the LCG experience considerably.

Some of the negative reaction to the LCG in the study's sample was associated with the lack of an on-going career education component in the groups' courses. Students complained that they felt the LCG was not congruent with the rest of the course and more emphasis on career education was needed. This negative reaction was not directed toward the Didactic/A-V approach. Perhaps the students felt more comfortable with the conventional format or they actually benefited more from it.

As an alternative learning method G/S shows promise. There is insufficient evidence to conclude that either method in this study is superior to the other for fostering career maturity in high school students. Careful integration of the LCG in a career education course where students have been introduced to more elementary G/S could be of value.

RECOMMENDATIONS FOR FURTHER RESEARCH

The LCG appears to be a complex, well-conceived educational learning method. The myriad process and decision-making variables which

could be gleaned from participation in this G/S render precise evaluation difficult. The problem of accurate evaluation has been central to the entire field of G/S. Its solution is now being recognized as a priority in career education.

G/S techniques have been shown to be exciting and productive methods for learning. The LCG appeared to be lacking in these qualities in the study discussed here. The following recommendations could serve to advance the effective use of G/S in education and to improve career education programs in general.

1. Development and research of new G/S based on the LCG model which have more motivational power should be undertaken.

2. The effects of voluntary participation as contrasted with required participation in a G/S experience could be clarified.

3. Further research on the validity of the CMI for measurement of career education objectives would be beneficial.

4. Research is needed which would provide new instruments to evaluate career education programs.

5. Student perceptions of their career planning needs should be investigated.

6. Counselors with expertise in career education should serve as school coordinators to assist students and advise staff.

7. Career education courses in teacher education programs should be expanded and further researched in regard to their effectiveness in preparing teachers to develop students' career maturity levels.

SUMMARY

Chapter 5 summarized the research on the inclusion of a

Gaming/Simulation (G/S) method, the Life Career Game (LCG) in a high school career education course. The effect of the LCG on the career maturity level of students was contrasted with a more conventional Didactic/A-V approach.

Two research hypotheses were investigated. Hypothesis one stated:

> Students who participate in the LCG method show greater gains in career attitudes than students who participate in the Didactic/A-V method.

The Attitude Section (CMI-ATT) of the Career Maturity Inventory was used to measure the dependent variable of career attitude. This hypothesis was not supported by the findings of the study.

Hypothesis two stated:

> Students who participate in the LCG method show greater gains in career competence than students who participate in the Didactic/A-V method.

Five areas of career competence were measured by the Competence Section (CMI-COMP) of the Career Maturity Inventory. Significant effects of method and school interaction were found on two parts of the CMI-COMP. Students at one of the schools in the experimental groups scored significantly higher scores for both experimental and control groups on Part 1 (Self-Appraisal), and Part 3 (Goal Selection) which suggested that the way in which the methods were implemented may have affected the dependent variables.

Finally, a significant interaction between sex and method was indicated which suggested that females in the experimental groups as a whole scored higher on Part 3 (Goal Selection). Lucid support for the superior effectiveness of either learning method was not achieved. The testing attrition rate and the length of the CMI were mentioned as factors

which may have negatively influenced the results.

Research to develop more stimulating G/S for career education programs was recommended. The need for accurate evaluative instruments in career education was listed as a priority. The establishment and study of career education courses in teacher education programs merited emphasis.

This study attempted to combine the two enigmatic areas of G/S and educational evaluation; perhaps this was expecting significant results where such statistical results could not be produced. Nevertheless, G/S is recommended as an educational supplement to those who are able to carefully implement and facilitate its use.

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APPENDIX A

ELEVENTH GRADE CAREER GUIDANCE PROGRAM

FOR TRACY HIGH SCHOOL

APPENDIX A

ELEVENTH GRADE CAREER GUIDANCE
FALL 1975
TRACY HIGH SCHOOL COUNSELING DEPARTMENT
John Coakley-Coordinator

"The World of Work" - Video Cassette - A General Overview of the Career Opportunities Through the 1980's. Classifies Careers into 12 Job Clusters.

Performance Objective #1 Each student enrolled in Mr. Meyer's, Mr. Guzman's and Mr. Treantos' (period 1, 3, 4E) U.S. History classes will graph his vocational personality by completing the Vocational Preference Inventory.

a. Each student completing the VPI will receive a general interpretation of results provided by the counselor.

b. Each student completing the VPI will be given the opportunity for individual interpretation of VPI results by the counselor.

P. O. #2 Each student enrolled in Mr. Meyer's, Mr. Guzman's and Mr. Treantos' (1, 3, 4E) U.S. History classes will graphically demonstrate his occupational daydreams, vocation choices, his competencies, and his abilities via the Self-Directed Search.

a. Each...will indicate in writing all the possible occupational alternatives most closely matching his vocational preferences, his interests, abilities and competencies as indicated by the Self-Directed Search.

P. O. #3 "How A Career Develops" - Video Cassette - An Overview of the Continuous Life-Long Process We Call Career Development. Each...will demonstrate how to appraise occupational information located in the Career Guidance Center by completing one "Occupational Worksheet" describing the essential characteristics of the job that most closely matches their interests as indicated by the Self-Directed Search.

P. O. #4 Omitted from the program.

P. O.. #5 Each...will write a career plan for themselves, indicating the pre-requisites required for entrance to that career choice, and the work required for successful accomplishment of the plan.

P. O. #6 Each student enrolled in Mr. Treantos' 5th and 6th period U.S. History classes will understand via the "Life Career Game" the way the labor market, educational opportunities, and marriage and leisure patterns operate in our society as measured by pre- and posttesting of the Career Maturity Inventory.

October 23rd - all junior class students will complete the Career Maturity Inventory (Competence Test and Attitude Scale).

October 31st November 24th
Experimental Group One will receive the "Life Career Game" treatment.

Experimental Group Two will receive the Holland "Self-Directed Search" and "Vocational Preference Inventory" with Films/ Cassettes, career exploration and career planning approach.

Control Group: will consist of those junior students who are not enrolled in U.S. History.

The data gathered will consist of scores on the pre- and post-test of the CMI. Pre-test will be administered October 23rd. Post-test will be administered in January. Briefly, the CMI has been conceived and constructed to measure the maturity of attitudes and competencies that are critical in realistic decision making.

The research hypotheses are:

1. Students who participate in LCG show greater career maturity as indicated by higher scores on the Attitude Scale of the CMI than those students who do not participate.

2. Students who participate in the LCG show greater career maturity as indicated by higher scores on the Competence Test of the CMI than those students who do not participate.

3. Students who participate in 11th grade Career Guidance will show greater career maturity as indicated by higher scores on the Competence Test of the CMI than those students in the control group.

January All junior class students will complete post-testing of the CMI.

Follow-Up:

1. Screening for Career Immaturity
Counselors will identify via scores on the CMI those students who are experiencing problems in career development. This process will assist counselors to utilize their time and resources more efficiently in counseling career-immature students and perhaps periodically checkpointing with the career-mature.

2. Assessing Guidance Needs
Results of the pre- and post-testing of the CMI will indicate student needs for curricular and guidance services in the area of career development. The CMI results will be used to assess what needs for guidance exist. This information will be used in determining how these needs can be fulfilled, and which ways of meeting them are most effective.

Terms:

1. Career Guidance Center, Tracy High School.
The C.G.C. is a centrally located resource center designed to provide people the opportunity of exploring and understanding the world of work.

2. The Career Maturity Inventory (C.M.I.) - by McGraw-Hill.
The CMI is designed to measure the maturity of attitudes and competencies that are critical in realistic career decision making.

3. Omitted from the program.

4. Life Career Game - by Bobbs/Merrill.
This game provides a simulation of the way the labor market, educational opportunities, and marriage and leisure patterns operate in our society. Life Career is designed to meet four basic requirements for intelligent career-decision making:

   a. A feeling for what the future will be like
   b. Accurate information about the alternatives or opportunities available
   c. A sense of how a life cycle is patterned
   d. Practice in decision making

5. The Self-Directed Search (S.D.S.) - by John D. Holland.
The S.D.S. is a self-administered, self-scored, and self-interpreted career development tool. The S.D.S. provides a counseling experience by simulating what a student and counselor might do in several interviews.

6. The Vocational Preference Inventory (V.P.I.) - by John D. Holland - A personality inventory composed entirely of occupational titles. The V.P.I. is used for several purposes:

   a. As an interest inventory, since its content is occupational
   b. As an inventory to assess the personality types in a theory of vocational choice
   c. As a technique to stimulate occupational exploration among high school students.

APPENDIX B

CAREER UNIT FOR CONTROL GROUP AT LODI HIGH SCHOOL

APPENDIX B

LODI HIGH SCHOOL

FALL 1975

HISTORY - ROBERT K. CLEMONS

CAREER UNIT

SESSION:

1. Discussion: Career Choices
2. Discussion: Living Wage Requirements
3. Filmstrip: "Choosing Your Job"
4. Discussion: Requirements For Jobs
5. Paper: Your Job: Its Requirements, Benefits, etc.
6. Discussion: Realistic Goals
7. Discussion: The Decision Making Process
8. Review of Some Jobs in Working (Terkel)